

VOL. 45, No. 5

MAY 1977

## CONTENTS

### TECHNICAL

Commercial Kinks	18
Improving Power Output of the IC-22	6
Radio Teletype — Part 5	11
Shortened Forty Metre Dipole	9
Technical Correspondence	24
Try This	10

### GENERAL

NZART Jubilee VK/ZL/Oceania	
Contest 1976 — Results	20
The Mt. Ginini Repeater	15

### DEPARTMENTS

ATV News	25
Awards Column	25
Contests	24
Hamads	30
IARU News	27
Intruder Watch	27
Ionospheric Predictions	29
LARA	27
Letters to Editor	24
Magazine Index	27
QSP	3, 4, 18, 24
Silent Keys	30
VHF-UHF — an expanding world	22
WIANEWS	4
20 Years Ago	27

### COVER PHOTO

Eddie Penikis VK1VP, John Tilley VK1FT and Norm Smith (top to bottom) raise the antenna for the Mt. Ginini Ch. 7 Repeater VK1RGI. The antenna is 3 bays of 4 gamma matched dipoles fed in quadrature and has an omnidirectional gain of 8 dB. See Story on page 15.

Photo by Martin Hood VK1ZME

# HAM

# RADIO SUPPLIERS

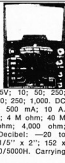
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Of intermediate size, this popular multimeter combines high accuracy with versatility over 24 ranges. Mirror Scale. Diode protected movement.

**SPECIFICATION:** 20,000 ohm/volt DC. 10,000 ohm/volt AC. DC Volts: 0.5, 1, 2, 5, 10, 50, 250, 500, 5000. AC Volts: 10, 50, 250, 500, 1,000. DC Amps: 0.05 mA, 5 mA, 50 mA, 500 mA, 5 A. Ohms: 12k ohm, 120k ohm, 1.2M ohm, 12M ohm. Centre Scale: 60 ohm, 600 ohm, 6k ohm, 60k ohm. Decibel: —20 to +62 dB. Dimension: 5 1/2 x 3 5/8 x 1 1/8 inches. Carrying case available. Model B — \$5.90.

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Pocket size.

AC/V: 10V, 50V, 100V, 500V,

1000V (10,000 ohm/V).

DC/V: 5V, 25V, 50V, 250V,

500V, 2500V (20,000 ohm/V).

DC/A: 50uA, 2.5mA, 250mA.

OHM: 60k ohm, 5M ohm.

Capacitance: 100pF to 0.1uF,

0.01uF to 1uF.

dB: —20dB to +22dB.

Audio Output: 10V, 50V, 120V,

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POST \$1.00

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DC/V: 2.5V, 10V, 50V, 250V,

500V, 5000V (20,000 ohm/V).

DC/A: 50 uA, 5 mA, 50 mA,

500 mA.

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12M ohm, 12M ohm.

dB: 20 dB to +62 dB.

Approx Size: 5 1/2" x 3 5/8" x 1 1/8". P & P 50c



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SYNTHESIZED COMMUNICATION RECEIVER



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AND 2-WAY NETWORK — \$7.90

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Cap: 70 watts RMS.

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Dot: Tweeter; Green Dot: Input.

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**SPECIFICATIONS, NC-310**

Transistors: 13.

Channel Number: 3, 27.24 OMHz Citz. Band.

Transmitter Frequency Tolerance:  $\pm 0.005\%$ .

RF Input Power: 1 Watt.

Tone Call Frequency: 2000 Hz.

Receiver type: Superheterodyne.

Receiver Sensitivity: 0.7 uV at 10 dB S/N.

Selectivity: 45 dB at  $\pm 10$  kHz.

IF Frequency: 455 kHz.

Audio Output: 500 mW to External Speaker Jack.

Power Supply: 8 UM-3 (penlite battery).

Current Drain: Transmitter: 120-220 mA.

Receiver: 20-130 mA.

**Price: \$105.90 pair; \$55.50 ea. Postage \$3.00.**



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# amateur radio

Published monthly as its official journal by the Wireless Institute of Australia, founded 1910.

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## QSP THE 1977 FEDERAL CONVENTION

By the time this appears in print the 1977 Federal Convention will be past history.

Whatever comes out of it however is not history. It will be the policy of the Institute as a whole. In exactly the same way that the policy of the Institute derives from all the past Federal Conventions.

The Federal Council, made up of the seven State Councilors with advice and assistance from the Executive, meets each year at what is called the Federal Convention. This is where the guidelines of the Institute originate. There is also provision for postal motions.

The discussions which are carried on in the Federal Convention are centred on current amateur radio affairs. These come forward to the Convention, through the seven Divisions, as Agenda Items. The Chairman of the Federal Convention can permit debate on other matters under what used to be called "general business" items. No advance notice is required for general business items and it stands to reason therefore that debate on these can be stopped if the Federal Council thinks more time is needed for research and general discussion in Divisional councils.

This is how the WIA as a whole makes up its collective mind. Whatever is decided by the Federal Council is going to affect every member in one way or another.

Did you, as a member, help your Division by suggesting anything constructive for discussion at the Federal Convention? If you, as a member, have an interest in any specific matter, do you ask your Divisional Federal Councilor to tell you what is the latest policy or position? Do you, as a member read the report in AR each year about that year's Federal Convention?

Unless you do you could become a mine of misinformation about the WIA.

**D. WARDLAW VK3ADW,**  
Federal President.

## QSP

### THEFT OF EQUIPMENT

From Bathurst Technical College, stolen between 1st and 4th of February, Pye model PF2VH on 458.05 MHz, serials 1231 and 1242, black in vinyl casing. Any information to Box 145, Bathurst, 2795, please.

### RECIPROCAL LICENSING PROBLEMS

"One German amateur went in September 1976 for the first time to Yugoslavia with the appropriate reciprocal licence. The licence was received before his departure and allowed mobile operation.

"Customs formalities both in and out of Yugoslavia caused no problems. The serial number of the mobile rig built into the car was entered in his passport and cancelled again when he left.

"Another German amateur who did not have a Yugoslav licence travelled through Switzerland and Austria into Yugoslavia. He had his two metre rig packed in his trunk and duly declared it to the Yugoslav Customs on entry. Several days later his rig was confiscated in his hotel room. Also, his car was temporarily confiscated and he had to pay a fine of the equivalent of DM 150.

"There appears to be little hope of his getting his rig back."  
(Thanks to DARC for permission to publish.) (Copied from "Mobile News", January/February 1977.)

### AOC and NAOC STUDY PACKAGES

Course materials are available to teachers of Amateur Radio from many sources. The ARRL is producing a great deal of very good Novice course information including teaching notes, student study guides and morse cassettes.

Roger Davis VK4AAR is producing a complete series of course notes from virtually YR8 level up to AOC. Morse cassettes are also available from this source.

Elizabeth Amateur Radio Club in VK5 has produced a home study guide which lists subjects and appropriate textbook chapters to study.

Your NAOC or AOC multi-choice questions are invited. They'll all be forwarded to the P. & T. Dept. Let's contribute questions of the standard we would like the exams to contain! Thanks to Rex Black VK2YA who has recently forwarded some questions.

VK3ZR.

### "INK EMMA INK . . . . ?"

Ex-Australian Special Wireless Group Operators (WW2) — If you would advise Steven Mason at 30 Jacqueline Road, Mount Waverley 3149, Vic., of your call signs and frequencies, we might be able to arrange a re-union on the air.

### SPACE IDEAS

"Starting in 1979 and following about every half-year thereafter, a space shuttle will take a cylindrical structure to an altitude of 556 km. Experimental packages will remain on board under austere conditions for six to nine months. Then another shuttle will retrieve it, return to earth and NASA will return the packages back to their owners. About 14 ft by 30 ft, the open aluminium cylinder can accommodate more than 70 experiments. The orbital environment, however, provides weightlessness, high vacuum, radiation and particle fluxes." This is a brief description of NASA satellite series LDEF (Long Duration Exposure Facility) appearing in QST January 1977.

# WIANEWS

For the record, members will have seen the WAINews SPECIAL insert into April AR quoting in full a Central Office letter explaining a number of changes relating to Novice licensing and operations, noting preliminary investigations into the probable grant of a site in Canberra for a national headquarters and a brief reference to an amateur radio brief for WARC 79.

## WARC 79

The Executive produced a draft of amateur radio background information which has since been circulated to Divisions. This document sets out to explain the amateur service as fully but as briefly as possible, its value internationally and locally, the great range of activities by amateurs, a very short historical précis, some reference to amateur radio's value in emergencies, the training of newcomers, references to interferences of various kinds, a short appreciation of the amateur satellite service and of course details of the frequency bands now allocated and required in the future.

Unlike the preparations for the last WARC in 1959 the IARU is now much better organised and, recognising that amateur radio is a global activity, has prepared material in a "model brief" form for use by IARU member societies. This document was drawn upon by the APG Committee 2.

A circular produced by the WIA Queensland Division quotes extensively from the Netherlands Amateur Radio Society's journal "Electron" and brings out very clearly the amount of support needed by national societies for WARC 79. Members are supporting amateur radio, including IARU, by being WIA members, but what about the non-members, it asks. One thing is certain. Amateur radio will not lose by default judging by the efforts of the WIA, the IARU and all the IARU member societies. All of this is expensive but essential to the survival of amateur radio to the year 2000 and beyond.

## 1977 CALL BOOK

The new ten year contract for printing a Call Book was still under

discussion with Central Office during March, but was finally clarified in April.

After discussion the Executive agreed that arrangements for publication should begin.

Given a fair wind there is some hope that the 1977 Call Book should come out by July or August.

## 1977 CONVENTION ITEMS

Agenda items for the 1977 Federal Convention began to arrive from Divisions a week or two before the deadline of 23rd March.

Here is a brief resume of the items.

### From VK2 —

Establish a 10m beacon band plan, review and, if necessary, amend the WIA 70cm band plan, review the 2m FM segment, including more repeater and simplex channels, set up a Novice licensing policy, examine the need for RTTY standards, discuss "CB", publish monthly callsign changes in AR, publish a WIA Year Book, review YRS/YRCS, morse for limited and novice licensees on VHF upwards, review Divisional broadcast timings, review the Federal repeater sub-committee's terms of reference, lower cost amateur licences for longer validity than one year, consider a VHF mileage factor for RD Contests.

### From VK3 —

Establish standards for ASCII, ask for a novice segment 29.0 to 29.5 MHz or equivalent on 10m, ask that Novice licensees should be allowed to use VFOs, ask for 51 to 52 MHz or 50 to 52 MHz, morse for limited and Novice licensees on VHF upwards and CW by limited licensees from 420 MHz up.

### From VK4 —

Print callsigns or SWL numbers on AR address labels, charge interest on overdue Divisional accounts with Executive.

### From VK7 —

Review RD Contest awards and Rule 11.

Too late for Agenda Items are some general business items for which advance notice is given. VK2 want an extension to the 576 MHz band and to seek permission for in-band 70cm ATV repeaters. The Executive want to get frequency details of Australian stations licensed to operate in shared amateur bands.

## QSP — continued PUBLIC RELATIONS

"With the vast amount of publicity currently given to CB radio, there's a lot of confusion in the minds of the public as to just what Amateur Radio is. Is it the same as CB? Is a "ham" an amateur or CBER? Stories by confused media writers have only worsened the situation. We need to take our story directly to the public — letting as many people as possible see for themselves what we do, how we do it and how they could do it too. The county fair has been a traditional place to demonstrate Amateur Radio in rural areas. Perhaps the shopping mall is the place to do it in urban areas." Article in Worldradio January 1977.

## PORTABLE/MOBILE IDENT.

QST editorial December 1976 queries the latest in the series of FCC deregulations as "deregulation or dilution?". It refers to the fact that from 28th November "FCC-licensed amateurs no longer are required to give advance notice of portable operation, and when operating portable or mobile no longer have to identify as such. Also, when a permanent move is effected, the requirement to use portable identification procedure no longer exists. In other words, the use of the slant bar on CW and indication of portable or mobile operation or phone is no longer required."

## INCREASED MEMBERSHIP

The editorial in QST January 1977 reflects upon the relative stagnation of amateur radio growth from about 1964 and reviews the steps taken to reverse this situation. "Then, equally suddenly," the editorial says, "there was another development. Numbers of CBERs began to realize that CB was a certain amount of fun, but that it was limited in its horizons. However, we managed to get the word to many of those CBERs that there was something to replace it, something whose horizons were unlimited, and that something was amateur radio . . . The League spotted these trends early in the game and recognised that some assistance could be provided. This past fall we had some 1,400 club groups giving amateur radio training to about 36,000 would-be Novices."

## LARGEST FCC RAID EVER

Under the heading in 73 for January 1977 the Associate Editor reported that Federal Marshalls and FCC agents raided 19 locations in the Baltimore-Washington area early on the morning of October 27th. Confiscated was over 65 thousand dollars worth of equipment used by outlaw SSB CBERs. This, he said, was the largest single FCC raid and capped a lengthy investigation by the Baltimore office in conjunction with the Laurel MD monitoring station.

Amateur equipment made up the bulk of the items — half a dozen linears, Heath and Yaesu transceivers, remote VFO's VHF, HT's, beams and rotors. Incidentally, he wrote, it was not the work of amateur operators that led the FCC to the outlaws, it was pure luck plus massive interference to radio users in the area.

## FULL CALL AFTER 20 YEARS FAMINE

A recent letter from Ann Goodall, XYL of John VK3ZBG, advised of John's success recently in obtaining his CW after 20 years with a limited licence.

Congratulations, John, and we look forward to hearing you on the HF bands as soon as your new call is allocated.

It would appear that Ann is also a devoted SWL, and the Goodalls have acquired an FDX 400 for their insomnia DX.

## VK MOBILE ADVENTURE

Brian VK1ZBL/VK1NAK will be operating mobile and portable through all mainland States for the remainder of 1977. The itinerary proposes Northern Australia for the winter months and Perth area around springtime. Bands operated will be 146 F3, 27 A1/A3, and 3.5 A1/A3. Brian will be attempting to maintain a scheduled appearance at 1000 hours GMT Thursdays on 3542 kHz QRP portable. The CW is still a little slow, but should improve rapidly. ■



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sends

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QLD:	Electronic Components	Phone: 371-5677

Trade Enquiries: NSW: 570-1392

VIC: 725-9677

# IMPROVING POWER OUTPUT OF THE IC-22

Phil Wait VK2ZZQ  
and Roger Harrison VK2ZTB

Perhaps the most popular two metre FM transceiver in Australia at present is the ICOM IC-22, one of the products of the burgeoning Japanese amateur communications manufacturing industry. Undoubtedly it enjoys this popularity owing to its price firstly, and secondly to its features. By reputation, if not largely in fact, it has perhaps the "hottest" receiver of similar transceivers intended for 2m FM mobile operation.

The RF power output of these transceivers is nominally 10W. Most units will probably produce close to this when first purchased. However, it appears from experience, that the RF power output deteriorates with use, some dropping below 6W. The reason for this is not fully understood, but suffice to say that the phenomena exists and is certainly measurable.

Now, this situation is not all that disastrous in itself as it is only in the order of 2-3 dB, but it isn't entirely welcome either as the IC-22 is intended as a mobile transceiver where every dB counts. The capture ratio of most modern FM receivers on the amateur market is around 2 dB.

Another problem arises when a 'boost amplifier' (often incorrectly referred to as a 'linear') is added, such as those kits that have become recently available as well as commercially made units. These devices produce about 35-45 W output from a nominal 10 W drive and are simply inserted in the coax between the antenna and the transceiver antenna socket.

## SWITCHING

Automatic Tx/Rx switching using either diodes or carrier-sensed relays is employed. If the drive is not up to the nominally required amount, considerably less than specified power output is obtained and the full gain of the device is often not realised. Gnashing of teeth, cursing the kit designers, tearing of hair and cries of "why doesn't anything work for me!!"

In the course of some development work on solid-state VHF power amplifiers, the IC-22 belonging to Phil VK2ZZQ was pressed into service as a driving source. Over a period of months the power output dropped from around 9 W or so to under 6 W when the unit was running from a

nominal 13V supply. A number of enquiries and measurements confirmed the effect, many units delivering only 6 W to 7 W. Accordingly, a replacement for the P.A. transistor was sought out.

The transistor settled on was the CTC B12-12. The gain of this device appeared to be more than adequate for the job and a power output of between 11 W and 15 W from a nominal 12.5V supply was expected. In addition, the device is rated to withstand infinite VSWR, at all phase angles, from a 16V supply.

However, the input and output impedances of the existing P.A. transistor in the IC-22 were not known. A little bit of the old amateur 'suck it and see' (otherwise known as eclectic empiricism — see reference 1) was obviously going to be necessary.

Some modification of the L-G matching networks was anticipated.

Accordingly, a B12-12 was installed in place of the original P.A. transistor. With due ceremony the power output was checked to ascertain what tuning up might be necessary. Power output measured at just on 12 W from a nominal 13V supply (reference 2). Adjustment of the stage input and output trimmer capacitors could not improve on this! Bandwidth is excellent, there being less than 0.5 W variation between 146 MHz and 147 MHz.

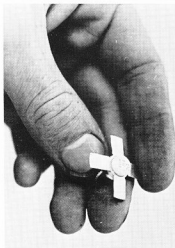


FIG. 1. THE B12-12 RF POWER TRANSISTOR

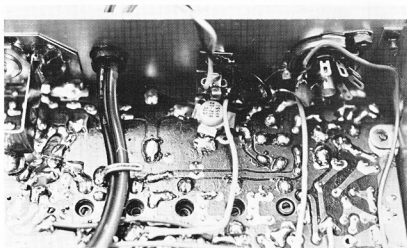
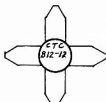


FIG. 4. THE B12-12 INSTALLED. THE COLLECTOR LEAD IS TO THE RIGHT, ADJACENT TO THE 'CTC' MARK



**FIG. 2. CAREFULLY CHAMFER THE LEADS OF THE B12-12 IN THIS FASHION**

Now for the actual conversion details. It is simplicity itself. Only the following explanation is complicated. You will need the following artisan's aids:—

- (a) One pair of household scissors,
- (b) One Phillips-head screwdriver,
- (c) One pair of long nose pliers,
- (d) One 20 W (min.) soldering iron,
- (e) 115 mm of knot-free 60/40 solder with genuine resin core,
- (f) One solder sucker,
- (g) One hand drill (of 2.6 v 10" erg capacity at rest)

OR

- one steam-driven electric drill with toothbrush, pencil and razor sharpener attachment.
- (h) One 3/16" diameter drill bit (sharp as a tack),
- (i) Thirty two minutes and 47 seconds of real time (as opposed to Greenwich mean time which is scotch anyway),
- (j) One hammer (to discourage distractions),
- (k) One centre punch (to rivet your attention).

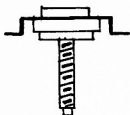
Firstly, the original P.A. transistor is removed. It is located on the under side (copper side) of the printed circuit board, towards the centre-back, immediately beneath the external speaker socket. Unbolt this socket and move it out of the way to afford easier access to the P.A. transistor.

Carefully desolder each lead of the P.A. transistor. The solder sucker ensures a neat, clean job and minimises the possibility of damage to the p.c. board. The transistor is bolted onto a flange that is attached to a flat aluminium heatsink bolted to the backdrop of the chassis/cabinet. Unbolt the transistor and carefully remove it. Don't discard it as it may be needed in the event of a catastrophe (like when junior decides that the B12-12 is a monster from Dr Who and promptly flushes it down the toilet).

Using the clearance hole in the p.c. board as a guide, put a punch mark (gently Bently!) on the flange so that it is positioned centrally with respect to the hole. Drill a 3/16" diameter hole in this position, carefully deburring it. This is to take the bolt of the B12-12. Smear the flange with silicone grease to ensure good thermal contact between the transistor and the flange.

Now, carefully chamfer each lead of the B12-12 with a pair of sharp scissors or small tin snips. Scissors are best. See figure 2. Insert the B12-12 into position and judge how the leads need to be bent in order to make connection with the appropriate lands on the p.c. board. The collector lead is adjacent to the CTC mark on the header and this is oriented towards the antenna socket. The leads may need to be shortened somewhat, depending on their original length. Bend them approximately as shown in figure 3. Take care not to stress the leads or the lead-to-ceramic-header junction. Insert the B12-12 into position again and check that the leads match up with the lands on the p.c. board without shorting to the adjacent ground plane. Resist the temptation to solder it in place.

If all is well, bolt the transistor in place, taking care that no vertical stress is placed on the leads and that they remain in correct alignment. Now you can solder the leads to the p.c. board. Replace the external speaker socket last of all. A view of the completed conversion from the under-side of the chassis is shown in figure 4.



**FIG. 3. BEND THE LEADS APPROXIMATELY LIKE THIS (ONLY TWO LEADS SHOWN FOR CLARITY)**

Connect the antenna socket to a 50 ohm dummy load to test the converted unit. A reliable means of measuring the power output should be used. Briefly hold the transmit button down and note the power output. Some tuning may be necessary. Do not hold the transmitter on for long periods until maximum power output is achieved.

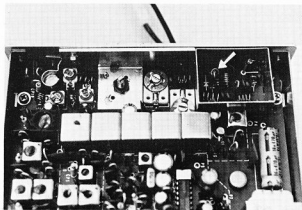
The RF output indication will now cause the meter to go full scale. This is easily adjusted. There is a diode that picks up some RF from a coil in the output network located in the shielded compartment adjacent to the antenna socket. Its location is indicated in figure 5. The diode is mounted with 1/2" leads. Simply bend it towards the back panel until the meter comes back on scale again when transmitting.

And that's about it. Double your deteriorated output power and drive your booster amp, neighbours, local repeater, etc. to distraction! The heatsink in the IC-22 gets hotter than it did previously, but the temperature rise is within the limitations of the transistor. Keep your overs short in any case — give the lower power stations a go!

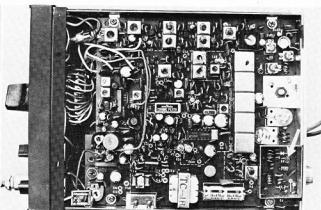
#### REFERENCES

- (1) Chambers 20th Century Dictionary, pages 334 and 346.
- (2) Bird 'Thru-line' wattmeter with 50 W, 50-250 MHz module and Delco 50 ohm dummy load.

Photos by Phil Wait WK2ZQZ



**FIG. 5. TOP VIEW OF IC-22 SHOWING THE B12-12 FIXING NUT AND THE RF OUTPUT PICKUP DIODE**



**FIG. 6. TOP VIEW OF CONVERTED IC-22. LOCATION OF THE RF OUTPUT DIODE IS INDICATED BY THE ARROW**



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COMPACT 120 WATT  
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FT-75B High power, for General use. FT-75BS Low power, for Novice use



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**Frequency Range:** 80 M 75 KHz segment, 40 M 100 KHz segment, 20 M 150 KHz segment, 15 M 240 KHz segment and 10 M 400 KHz segment.

**Mode:** Upper Sideband for 20, 15 and 10 meter bands. Lower Sideband for 80 and 40 meter bands. CW for all bands.

**Frequency Control:** Crystal control VFO with 3 channels per band.

**VFO Coverage:**  $\pm 3$  KHz for 80 M,  $\pm 3$  KHz for 40 M,  $\pm 3$  KHz for 20 M,  $\pm 3$  KHz for 15 M and  $\pm 6$  KHz for 10 M.

**Antenna Impedance:** 50 Ohm unbalanced.  
Size: 210(W) x 80(H) x 300(D) mm.

**Weight:** 3.8 Kg.

## RECEIVER

**Sensitivity:** 0.5  $\mu$ V for 10 dB Noise plus Signal to Noise Ratio on 14 MHz for SSB and CW.

**Selectivity:** 2.3 KHz nominal bandwidth at 6 dB down, 4.5 KHz at 60 dB down on SSB and CW.

**Harmonic & Other Spurious Response:** Image Rejection better than 50 dB. Internal Spurious Signal below 1  $\mu$ V equivalent to antenna input.

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**Audio Output:** 2 Watts at 4 Ohm impedance.

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**Microphone:** 50 K Ohm dynamic type.

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# A SHORTENED FORTY METRE DIPOLE

J. R. Trevena VK3AZX  
101 Wanda St., Mulgrave, 3170

This is not a new idea, but one which may be of interest because of its size and light weight. It can be used with a single mounting and also can be rotated, as it is at this QTH.

The idea of making this dipole came after the successful use of centre loaded whips for 3.5, 7.0, and 14.0 MHz whilst operating portable during caravan holidays over the past 5 or 6 years. The dipole is constructed using two of these whips mounted horizontally opposing each other and fed with coaxial cable through a 4:1 balun. The SWR is 1.2:1 or better over approximately 15 kHz.

The coils are the heart of any loaded antenna system and must have very low loss, but mechanical stability is also a factor. Several ideas were tried and this one has proved quite satisfactory.

The material is readily available from plumbers and aluminium suppliers.

The results have been compared with an inverted "V", an inverted G5RV and a loaded whip, and in all cases of VK4, VK6, P29 and ZL contacts, the loaded dipole was as good or better than the others. One factor was noise, the three comparison antennas being 1 to 3 "S" points greater in noise level than the horizontal loaded dipole.

The total length of the dipole is 22 ft. 4 in. This may vary quite considerably if larger or smaller diameter tubing is used. The outer section is constructed so as to give a variation of 18 inches in length i.e. 3 ft. overall, which should cover all conditions of adjustment.

## CONSTRUCTION DETAILS

### LOADING COILS

Cut a 4½ in. length of 1½ in. PVC tube and cut out as shown in Fig 1 to serve as a skeleton coil former. Fig 2 shows the

general arrangement of the antenna assembly.

Cut a length of 2½ in. PVC tube 5½ in. long for the coil casing and fit a disc each end made from a piece of ¾ in. thick bakelite or fibre glass sheet. Remove these discs until later.

Cut a piece of 2 x 1¼ in. aluminium channel 1¼ in. long and drill and file a hole in each of the parallel sides to fit neatly over the 1 in. aluminium tube. Fit a U-bolt to hold the tube to the bracket, and fit this bracket to the fibre glass discs with 4 nuts and bolts (nuts outside). Drill and tap bracket to take solder lug for coil termination, duplicate this bracket for the ½ in. tube at the other end of coil and fit one end disc to the coil casing, securing it with PVC cement and 4 screws tapped in radially.

Next close wind 15 ft. of wire for the coil on the 1½ in. diameter tube, release tension and slip it off tube. Drill two holes 1/16 in. diameter each end of coil former for termination of winding, ease the winding on to the former and terminate one end leaving one inch of wire protruding. Stretch winding carefully to cover coil former from end to end of open section and terminate remaining end, once again leaving one inch protruding. The wire should be fairly tight on the former. Now space the winding with a piece of thin cord evenly over the whole of the former, fix wire with PVC cement and leave to set. Match-sticks can be used to keep turns evenly spaced whilst cement is setting.

Drill holes in the discs to take the coil ends, slide the coil inside the casing and fit remaining end disc with cement and screws as before. Solder a lug to each end of coil. A check with a GDO should show self-resonance at approximately 45 MHz. Duplicate for other coil and seal all holes with PVC cement.

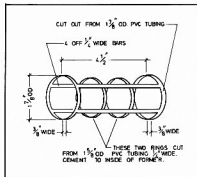


FIG. 1

## ELEMENT CONSTRUCTION

The telescopic section is next to be constructed.

If the ½ in., ¾ in. and 1¼ in. sections do not fit snugly into their mating sections, expand one end of each a little with a tapered tool to give a fairly tight sliding fit.

The lengths required for each section are (in inches):

Diameter	Length
1	36
¾	36
½	24
¾	21
¼	30

Overlap the 24 in. and 21 in. sections 3 in. into their mates and fit 3 self-tapping screws around tube at each end of overlap. Leave the ¼ in. outside section free until final adjustment, then fix likewise. Attach 1 in. and ¾ in. sections to the coil and tighten U-bolts. Duplicate for other sections of dipole.

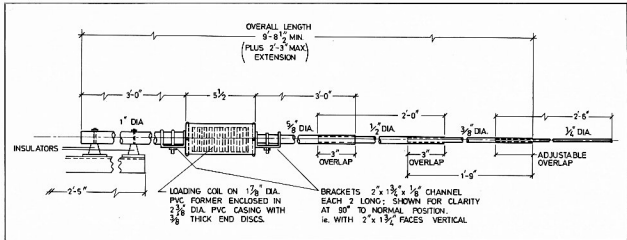


FIG. 2: Arrangement of each Half of Loaded 7 MHz Dipole.

## TESTING

We now have two  $\frac{1}{4}$  wave whips, so we can check each independently. If you have a metal roof, fix an insulator to hold one of the  $\frac{1}{4}$  wave sections as a vertical and check resonance with a GDO. Adjust to about 7050 kHz, feed antenna with 50 ohm coaxial cable, check SWR and adjust for best SWR. Do the same for the other  $\frac{1}{4}$  wave section at the same frequency. You will probably find a slight difference in the length of the two sections. Maintain this difference in the final configuration.

Next, mount the two half dipoles to the four stand-off insulators and attach to the remaining section of aluminium channel.

Mount the balun and connect the 4:1 ratio and reverse of normal, that is with the coaxial cable to the antenna terminals and the antenna to the coaxial terminals. This is because the antenna feed point impedance is in the order of 10-12 ohms.

Mount the antenna about five feet or so above the roof or part way up the mast and check resonance and SWR. Adjust for best SWR at 15-20 kHz higher than the frequency required, because the resonant frequency will drop slightly as the antenna is raised to the full height above ground.

Finally, fasten the  $\frac{1}{4}$  in. sections of tube with self-tapping screws. Cover all telescopic joints with Araldite, tighten all screws and U-bolts and cover the screws and nuts also with Araldite.

Footnote: Suitable baluns are described in the ARRL Radio Amateur's Handbook 1971, page 350, or Electronics Australia, October 1965.

## MATERIAL REQUIREMENTS

Aluminium Tubing: 1 in. OD 18 SWG 6 ft.;  $\frac{1}{2}$  in. OD 18 SWG 6 ft.;  $\frac{1}{2}$  in. OD 18 SWG 4 ft.;  $\frac{1}{2}$  in. OD 18 SWG 3 ft. 6 in.;  $\frac{1}{4}$  in. OD 18 SWG 5 ft.

Aluminium channel 2 in. x  $1\frac{1}{4}$  in. x  $\frac{1}{2}$  in. thick 3 ft.

White PVC Tubing 2 $\frac{1}{2}$  in. OD  $\frac{1}{2}$  in. thick 1 ft.; 1 $\frac{1}{2}$  in. OD  $\frac{1}{2}$  in. thick 0 ft. 6 in.; 1 $\frac{1}{2}$  in. OD  $\frac{1}{2}$  in. thick 0 ft. 6 in.

Insulators Stand-off 1 in. 4 off.

Bolts "U" 1 in. x  $1\frac{1}{2}$  in. long cad plated 2 off;  $\frac{1}{2}$  in. x  $1\frac{1}{2}$  in. long cad plated 2 off.

Fibre glass sheet  $4\frac{1}{4}$  in. square x  $\frac{3}{8}$  in. thick.

Enamelled wire 16 SWG 30 feet (15 ft. each coil).

Bolts, nuts, fibre washers, PVC cement and Araldite.

## TRY THIS

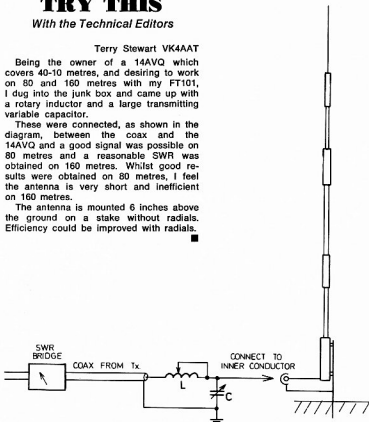
With the Technical Editors

Terry Stewart VK4AAT

Being the owner of a 14AVQ which covers 40-10 metres, and desiring to work on 80 and 160 metres with my FT101, I dug into the junk box and came up with a rotary inductor and a large transmitting variable capacitor.

These were connected, as shown in the diagram, between the coax and the 14AVQ and a good signal was possible on 80 metres and a reasonable SWR was obtained on 160 metres. Whilst good results were obtained on 80 metres, I feel the antenna is very short and inefficient on 160 metres.

The antenna is mounted 6 inches above the ground on a stake without radials. Efficiency could be improved with radials.



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### PA12-12

This Kit is intended as a booster amp. for 2m SSB/FM low power or hand-held transceivers. Diode Tx/Rx switching included. Typically gives 13W to 15W output from 1.5W to 2.5W drive, efficiency better than 85% draws 1.4A at 12.6V and has a bandwidth of about 7 MHz. Also constructs on our 50 x 75 mm PA board (PA-3). Uses CTC B12-12 transistor. Just the thing for your Ken, Standard or IC2021.

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### PA40-12

This Kit features Stripline Construction and is intended as a booster amp. for 10W 2m SSB/FM Transceivers; it includes Diode Switching for Tx/Rx — replaces our ETI-710 kit. This new design provides more consistent results, simpler construction and alignment and presents a low SWR to the driving source. Constructed on a double-sided fibreglass PC board. Delivers 40W. 50W output (class C) from 8W-12W drive, efficiency greater than 60%, draws 5.5A at 12.6V, excellent linearity on SSB. Minimum gain 5.5 dB. Uses B40-12 transistor.

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# RADIO TELETYPE

Jostein Gjerde, LA7MC

## PART 5 AN RTTY CONVERTER WITH ACTIVE FILTERS

This month's article has been adapted from an original article by DJ6HP by LA7MC. This article was of such length that it has been necessary to split it into two portions. The active filter is an alternative to the LC filters for which appropriate inductors are often hard to locate. The DJ6HP system must be the RTTY converter to beat all RTTY converters. Read on and find out why.

Most RTTY amateurs use their SSB station for transmission and reception. The signal they use for the printer is taken from the receiver's low-frequency output. The low frequency converter which is coupled after controls the receiver magnet in the teleprinter. On the other hand the AFSK signal is carried to the transmitter microphone input and radiates as an ordinary SSB signal.

The RTTY converter described here has, compared against the previously described constructions (including ST5 and ST6), the following advantages:—

- (a) continuous shift adjustment by means of a potentiometer,
- (b) by using active filters you can do away with the inductances which till now have been used for this,
- (c) the Q quality for the active selection circuits is proportional to the frequency, thus the bandwidth in Hertz remains constant,
- (d) the active filters operate by simple means so that the converter becomes flexible and can be adjusted to different operating requirements,
- (e) setting up is very non-critical and adjustment takes less than 5 minutes.

The RTTY converters work almost always on the same principle. The low frequency signal from the receiver is passed on to the limiter V1 (Fig. 1) which is no more than a stage with a very high voltage amplification. Also, many small low-frequency voltages pass through the amplifier completely, so that at the output of V1 the whole low frequency spectrum from the receiver is present at the same amplitude. The voltage peaks are cut off, as the amplifier is always supplied with sufficient input to give positive and negative limiting (saturation and cut off).

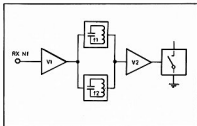


FIG. 1. Basic TU Schematic

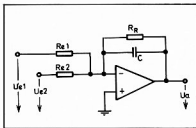


FIG. 2. Basic Active Filter

The limiter serves also to bring all low frequency signals from the receiver up to a constant amplitude value. The amplification factor of V1 fulfills this necessary function.

It is often maintained that the limiter suppresses the AM components. This happens unfortunately only in HF and medium frequency limiter stages where the amplitude, which varies mutually with the modulation, is cut off. Low frequency limiters thus amplify useful signals and noise signals.

After the limiter follows the choice of the two low frequency tones F1 and F2 which correspond to mark and space. These tones are for 850 Hz shift for example 1050 and 1900 Hz or 2125 and 2975 Hz. For 170 Hz shift one can use for example 1050 and 1220 Hz or 2125 and 2295 Hz.

In the two selection circuits the two low frequency tones for mark and space are filtered out of the frequency band containing signals with similar amplitude as a result of the limiter's action. When the maximum speed from RTTY is no higher than 50 baud, there is a 3 dB bandwidth of 50 Hz. Besides the selectivity effect, this also brings a low pass filter effect where higher keying frequencies are damped by the narrow band selectivity in the filter.

If you rectify the amplified and filtered low frequency signal for the frequencies F1 and F2 you will not get a square pulse as the frequency relationship is limited by the 3 dB bandwidth of 50 Hz. (This is due to the rise time of the narrow filter, that is the time taken for a signal to build up to a steady value, being significant compared to 22 mS.—Ed.)

For this reason there follows a type of filter which produces square pulses from the input signal. These square signals are used to operate a keying transistor which then keys the receiver magnet in the teleprinter.

### DESIGN OF THE CONVERTER

With limiter amplifiers today it is usual to use an operational amplifier with high amplification. Amplification can be about 90-100 dB, that is 100,000 times. For this purpose type 709 IC amplifiers will be useful and this type is produced by most firms who make integrated circuits.

If you go from an average amplification of 50,000, 0.5 mV at the input will be sufficient to operate the operational amplifier, if you assume a supply voltage of  $\pm 15V$ . In this way you have with type 709 an ideal limiting amplifier as with its effective clipping all signals from the receiver's low frequency output will be brought to the same level.

In published literature on the subject it is always recommended to have a band pass filter before the limiter. This filter is so made that the two tones for mark and space lie within the limit frequencies of the filter. This filter is most often constructed of LC and gives 40 dB suppression to the undesired signals provided that the filter is produced in good amateur fashion.

The task of the filter is to damp the spurious signals with higher amplitude than the useful signal, such that they become weaker than the useful signal. If the amplitude of the spurious signals is greater at the input of the limiter, the useful signal will appear as a voltage superimposed on the noise signal and will be cut off by the limiter. If such a noise signal falls within the pass band of the coupled filter, printing errors cannot be avoided. The best result occurs when the input filter only lets the useful signals pass. But if the noise signal falls within the frequency of one of the two channels, typing errors can only be prevented by a logic circuit, provided the other channel is noise free. For amateur use such a logic circuit could be too expensive.

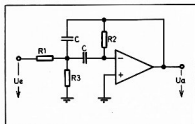


FIG. 3. Active Tuned Circuit



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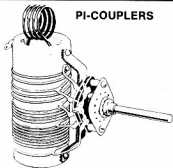


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## PI-COUPLED



### WILLIS MEDIUM POWER TYPE

For use up to 600 watts p.e.p. Match plate loads of 2,000 to 3,500 ohms (Z) and higher into co-axial cable. Operating Q increases on higher frequencies to increase harmonic suppression, enabling practical values of tuning capacity to be used on 10 and 15 metres and allowing for wiring inductance (L). Incorporating extra switch section for shunting additional capacity (C) if required, or switching other circuits. Switch rated for 10 amps. at 2,000 volts with contact resistant (R) of 0.8 milli-ohms.

Suggested for use in "A LINEAR POWER AMPLIFIER FOR AUSTRALIAN CONDITIONS" (Refer "Amateur Radio", April, May & June issues, 1976).

PRICE: \$23.95

**William Willis & Co.**

PTY. LTD.

Manufacturers and Importers

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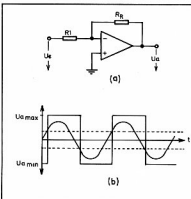


FIG. 4 — (a) Simple Inverting Schmitt Trigger  
(b) Schmitt Trigger Waveform

The necessary selection circuit in the "heart" of the converter for filtering mark and space frequencies is always more easily built with LC resonant circuits. Every RTTY amateur who has built a converter or tried to improve a commercial type has found that the inductance is some unpleasant, unknown size. On one hand, the winding of the coil can be a tiresome process, on the other hand you have almost no control of the Q value such that you are required to test it out.

If you wish in addition to be able to receive different shifts, the work and cost

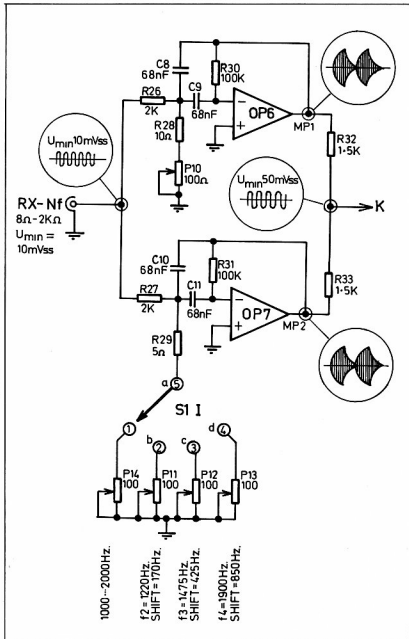


FIG. 5. Tuneable Mark-Space Filter

of the coils increases proportionately, if you wish to avoid the bandwidth attenuation attained by parallel coupling of different capacitors in the wiring circuits. No one previously thought of using continuous shift variation, since to vary capacitors in the order of 0.1 uF and coils in the order of 100 mH was difficult to achieve.

With modern electronics it is possible to avoid these difficulties, through the use of operational amplifiers increasing the resonance characteristics of the RC

circuit, such that you can attain characteristics similar to an LC circuit. Fig. 2 shows a low pass filter whose output is the sum of two input signals. Fig. 3 shows how you can connect an operational am-

**TELETYPES**, Repairs, Changeover Mechanisms, Spares, Paper Rolls and Tape, MACHINES FOR SALE, Network Engineering, 492 Jones St., Ultimo, N.S.W. 2007. Phone (02) 211-4630.



# THE MT. GININI REPEATER

Martin Hood VK1ZME  
12 Womba Pl., Girilong, 2617

On Saturday, 12th February, an enthusiastic team of workers scaled the tortuous road from Canberra to Mt. Ginini to install the long awaited Chznnel 7 repeater. There was no shortage of willing hands as VK1WI portable was also occupying the Mt. Ginini site for the John Moyle Memorial Field Day. As well as a good collection of VK1's, Chris VK2ZDD, Jamie VK2YC, Arthur and Dave VK2BDT ventured from VK2 to assist.

The installation was the culmination of two years of hard work by Peter VK1DS, who has mothered the project since the completion of the Mt. Majura Channel 6 repeater at Easter in 1975.

That the repeater was installed in its final location and was operating within one day is testimony to the careful design and rigorous testing undertaken before the installation proceeded. Mt. Ginini is a most unpleasant one and a half hours drive from Canberra and under snow for four months of the year, thus the reliability required of the repeater needed to be of the highest order. Mt. Ginini is also an excellent VHF location and while not the highest peak in the vicinity, is the tallest with road access and readily available power.

The repeater has proved itself to be extremely powerful and has considerably broadened the range of stations contactable on VHF from Canberra. Stations have already been worked from as far away as Griffith, Deniliquin, Raymond Terrace, Cooma, Echuca, and Sydney as well as many others. Signals from the edge of the service area have generally exhibited a very slow fading characteristic, with a period of three or four minutes, however there is little point in running high power to access the repeater unless your receiver can more than match the repeater's extremely sensitive receiver. Experience has shown that the repeater hears slightly better than it talks.

The repeater uses custom designed circuitry with careful attention to those characteristics peculiar to repeater service, in particular, a receiver which is free from spurious responses, has a high overload margin, good sensitivity and low noise figure, and a transmitter which has very low spurious output, both in-band noise and harmonics. The transmitter and receiver are combined in an 8 cavity temperature compensated aluminium duplexer and fed to the antenna via 4 MHz band-pass filter. The antenna is 3 bays of 4 gamma matched dipoles fed in quadrature and is connected via 50 ft. of RG8 double screened coax. The control logic is TTL and CMOS and uses a PROM to store the callsign.

As with all projects of this type, many people assisted along the way to the final



Many willing hands make the final adjustments to the mounting hardware, while designer Peter Smith (left) looks on. Photo by Martin Hood VK1ZME

success of the project. Peter Smith designed and constructed the transmitter, receiver and antenna and generally carried the project when others lost interest. Martin Hood designed and built the control logic and machined most of the duplexer. John Tilley assisted with the detailed testing of the antenna. Norm Smith manufactured the antenna mounting brackets, Eric Piraner and Eddie Penikis were jointly responsible for site liaison, and a host of other people too numerous to mention helped in installation and in other ways.

The ultimate success of the project lies not so much in the installation of a repeater with phenomenal service range or of great technical elegance, but more in the use to which the repeater is put.

Plans already exist for using the repeater for divisional broadcasts, and doubtless other applications will suggest themselves. Finally users are reminded that the repeater is principally for use by stations which cannot communicate directly, and that if you time out you have talked for much too long.

## VK1RG1 SPECIFICATIONS

### Location:

Mt. Ginini, 40 km south-west of Canberra 147° 47' E, 35° 38' S.

### Callsign:

VK1RG1.

### Frequency:

146.35 MHz input, 146.95 MHz output (Channel 7).

### Receiver:

Input noise figure: 2.0 dB.  
Mute threshold: 0.05 uV (approx.).  
Sensitivity: 0.1 uV for 10 dB quieting;  
0.25 uV for 20 dB quieting.

### Transmitter:

Power output: 25 watts.  
Spurious output: Less than -90 dB on 25 watts at  $\pm$  600 kHz from carrier.

### Antenna:

3 bays of 4 gamma matched dipoles fed in quadrature (90° out of phase).  
Beam width (horizontal): 20°-30°.  
Azimuth pattern: Omnidirectional  $\pm$  1.5 dB.  
Calculated gain: 7-9 dB over single dipole.

VICOM the communication specialists

## NEW PRODUCTS



### ATLAS 350-XL

- \* Completely solid state design
  - \* Broadbanded power amplifier
  - \* 110 160 metres coverage
  - \* 360 watts pep input. Work the World barefoot!
  - \* RTT. Audio frequency notch filter. VOX, full break in cw operation.
  - \* Digital display
  - \* Optional plug-in auxiliary VFO or xtal oscillator
  - \* Accessories include matching set supply
  - \* Same plug-in-and-go feature as the famous 210X
- The 350-XL has all the new features and superior performance you want, and should expect to have in a deluxe transmitter.

#### RECEIVER SPECIFICATIONS:

**Circuit Design:** Direct conversion of signal to 5595 kHz I.F. using double balanced diode ring mixer. Provides exceptionally high immunity to overload and cross modulation. **Sensitivity:** Requires less than 0.4 microvolts for 10 dB signal-plus-noise to noise ratio, 1.5 to 25 MHz, less than 0.6 microvolts, 28 to 30 MHz. **Noise Floor:** -135 dBm. **Blocking:** >105 dBm. **Intermodulation Distortion:** >80 dBm.

**Image Rejection:** Down more than 60 dB. Local oscillator is 5595 kHz above the signal frequency on all bands. **Internal Spurious:** Less than equivalent 2 microvolt signal in amateur bands. **AGC:** Audio output is constant within 4 dB with signal input from 5 microvolts to more than 3 volts. **Overall Gain:** 1 microvolt signal input provides more than 1/2 watt audio output (CW carrier with 1000 Hz heterodyne). **Audio Output:** 6 watts at 10% distortion, 300 to 3000 Hz, plus or minus 3 dB. **Internal Speaker:** 3-inch diameter, 4 ohm, 0.68 ohm, magnet rear jack permits plug-in of larger speaker in AC power supply cabinet. **Meter:** Reads "S" units from 1 to 9 and plus 10 to 50 dB. **Calibrator:** Provides calibration markers at 25 kHz increments on tuning dial. **Dial Set Control:** Permits adjustment of tuning dial to exact calibration at 25 kHz increments. **Incremental Tuning (R.I.T.):** Permits plus or minus 5 kHz.

#### TRANSMITTER SPECIFICATIONS:

**Circuit Design:** Broadband circuitry, eliminates transmitter tuning. Only the "preselector" control requires peaking. Single conversion produces minimum spurious products. 2 section low pass output filters provide high harmonic and TVI suppression. ALC panel adjustment. Infinite SWR protection reduces transmit power as SWR increases. At SWR of 4:1 input power is down to approximately 25 watts, which will still permit communications, but with low output. **Power Rating:** 1.5 to 25 MHz, 350 watts P.E.P. input and CW input, 28 to 30 MHz, 250 watts P.E.P. input and CW input, (50 ohm nonreactive load, 14 volt D.C. supply).

**Power Output:** 1.5 to 25 MHz, 160 watts minimum, 28 to 30 MHz, 100 watts minimum. **RTT-SSTV Power Rating:** Approx. 180 watts input, depending on heat sink ventilation. **Spurious Suppression:** Unwanted Sideband better than 60 dB at 1000 Hz audio input. Carrier down more than 50 dB. Third order distortion approx. 30 dB down. Harmonic output and other spurious output signals are more than 40 dB below peak input. **CW Transmit:** Full break in operation. Automatic frequency offset moves transmit frequency 800 Hz higher in frequency. Sideband included, with internal adjustment for pitch and audio volume as required. **Transmit Control:** Manual transmit with panel switch, PTT (Press to talk) with Mic, button, or VOX (Voice operated transmit). VOX controls are thumb wheels accessible just under front edge of cabinet. Mic. jack is on front panel, and also on rear panel. **Microphone:** Dynamic or crystal. High impedance. Requires 1/4 in. diameter 3 circuit plug. (Plug is supplied with transceiver, but microphone is not.) **Audio Fidelity:** 300 to 3000 Hz, plus or minus 3 dB. **Meter:** Reads P.A. collector current, 0 to 32 amps, or reflected voltage from built-in SWR bridge. **Linear Amp Control:** Rear terminals provide for keying of linear.

When you buy from VICOM you get spares and technical support from the people who care!

## ANTENNAS

### NEW JAYBEAM ANTENNAS

2 METRES	
16V/2M 5dBi, 7.8dBi, 11kw peak	\$36
8V/2M 8dBi, 9.5dBi, 11kw peak	\$29
10V/2M 10dBi, 11.4dBi, 11kw peak	\$57
16V/2M 10dBi, 11.4dBi, 11kw peak	\$66

70cm

DB7/70 10dBi, 12.3dBi, 11kw	\$46
PBM18/70 18dBi, 14.9dBi, 11kw	\$57
MDM48/70 48dBi, 15.7dBi, 11kw	\$55
MDM68/70 68dBi, 15.5dBi, 11kw	\$68

## GO MOBILE HF MOBILE ANTENNAS

### HUSTER MOBILE ANTENNAS

Quality Huster Resonators, precision wound with optimum design for each band, adjustable rod for lowest SWR:			
RM80 (80 metres)	\$26	RM20 (20 metres)	\$22
RM40 (40 metres)	\$25	RM15 (15 metres)	\$22
RM10 (10 metres)	\$22	RM11 (11 metres)	\$19
MO2 Mast for above	\$26	RSS-2 Spring	\$11.50
BMI-1 Bumper Mount	\$19		

### MARK HELICAL WHIPS

Quality 6' Helwhips providing 50 ohm match at resonant frequency. **HW20 (20 metres)** Resonant freq 14.2MHz, bandwidth 250KHz \$31  
**HW40 (40 metres)** Resonant freq 7.2MHz, bandwidth 100KHz \$31  
**HW60 (60 metres)** Resonant freq 4.8MHz, bandwidth 50KHz \$31  
 Chomel plated spring base Model LDS \$13  
 Modified base mount \$17.50

### RAK TRAP DIPOLES

AL240XN (140/80 metres)	\$47
AL240XN (20/40 metres)	\$45
MDV11H (160/40/20M)	\$48
MDV11H (160/20/40M)	\$48
MDV11V (80 thru 100M)	\$58



Mudy Y N

### SURFA PARABOLIC DISH FOR 70cm and 1296MHz

#### FEATURES

- For X-Band & 2.2GHz (Ka) Bands
- Quick & Easy to Assemble
- Compact & Light weight

#### SPECIFICATIONS

Aperture	1.2m
Gain @ 70cm	12dB
Gain @ 1296	20dB
Beam width	20°
Front to back ratio	> 20dB
Return loss	< 0.5dB
SWR	1.1/1.3
Weight	1.2kg
Weather proof power	10W
Full band coverage	100%
Dist. between	100cm
Net weight	1kg

Price per unit including postage



## BRIDGE THE GAP TO PEAK PERFORMANCE

## new! ANTENNA NOISE BRIDGE

Antenna Noise Bridge (A.N.B.) is the answer for a good SWR! It's the only device that checks your antenna system for resonance frequency and impedance. This is extremely new concept in antenna testing. It can be used with any antenna, even a non-resonant antenna, but it is more useful and accurate. It can be used with any antenna, even a non-resonant antenna, but it is more useful and accurate. It can be used with any antenna, even a non-resonant antenna, but it is more useful and accurate. It can be used with any antenna, even a non-resonant antenna, but it is more useful and accurate.

Available in two models: the TET-01 for 1.8MHz to 30MHz range priced at \$30... the TET-02 for 30MHz to 300MHz priced at \$45.

## COUPLERS

CL66 500w pep, 3.5 thru 29MHz, input impedance 50-70 ohms, output impedance 10-600 ohms unbalanced. Includes 4 position coaxial switch. \$129	
CL65 500w pep, 2.5 thru 29MHz, input impedance 50-70 ohms, output impedance 10-600 ohms unbalanced. \$129	
CS2012, includes quality swr/power meter which operates up to 150MHz. The coupler covers 2.5 thru 28 MHz at 500w pep. \$210	
CL99 for two meters. Max power 200w pep, output 10-200 ohms unbalanced. \$59	

## KENWOOD SPECIALS!

TS820 transceiver (ext mic) 160-10m	\$850
TS820 ac/dc (ext mic) 80-10m	\$570
VFO B20	\$140
DG-1 Digital Display	\$155
SP520 - 520	\$ 33

## uniden

## Still the BEST VALUE



### HF PLL Transceiver

Uniden 2020, complete \$772  
 Digital VFO \$145  
 Matching speaker \$ 40

Vicom for technical support

### AIGA ROTATOR SPECIFICATIONS SUMMARY

MODEL NO.	ART-8000	ART-3000A
Rotating Torque	2,500kg/cm	180kg/cm
Braking Torque	10,000kg/cm	1,200kg/cm
Maximum Vertical Load	2,500 kg	250 kg
Drive Type	4 : 5 Gear	4 : 5 Gear
Power Requirements	(May be modified upon request)	(May be modified upon request)
Operation Temperature	-40°C ~ +40°C	-40°C ~ +40°C
Forward/Reverse Delay	3 seconds	3 seconds
Maximum Continuous OP	20 minutes	3 minutes
Mast Clamp	48 - 75 g	34 g - 50 g
Cable Requirement	9 conductor	8 conductor
Net Weight	85kg	5.7kg
Shipping Weight	27.5kg	6.5kg

### ART-3000



## ROTATOR

## NEW

ART3000C Heavy Duty	\$189
ART8000 Super Duty	\$450

## LOW PASS FILTER



### TVI FILTER

\$20

Superb quality low pass filter (129MHz cutoff) for transmitters 1.8 to 30MHz. Insertion loss under 0.5dB, input/output imped. approx 50 ohms. Supplied with 50239 sockets. Will handle 200W pep (max). \$20  
 1 kw pep model (0.3dB insertion loss). \$35

### POPULAR VC2 SWR/PWR METER

The popular VC2 covers 3.5 to 150 MHz with power measurement 12/120 watts. Will handle up to 1000W, 50 ohms impedance, term meters. This quality true instrument is ideal for the shack or for permanent mobile installation. \$36 + P&P



\$36  
 SWR/PWR  
 METER



## NEW IC245

**ICOM**

The VFO revolution goes mobile with the unique, ICOM developed LSI synthesizer with 4 digit LED readout. The IC245 offers the most for mobile on the market. The easy to use tuning knob moves accurately over 50 detent steps and assures excellent control as easy as steering the vehicle. With its optional adapter, the IC245 puts you into all mode operation on 12v dc power with a compact dash-mounted transceiver. In FM, the synthesizer command frequency is displayed in 5kHz steps from 144-148MHz and with the sideband adapter the step rate drops to 100Hz from 144-148MHz. For maximum repeater flexibility, the transmit and receive frequencies are independently programmable on any operation. The IC245 even comes equipped with a multiple pin Molex connector for remote control. The IC245 is a product of the revolution in VFO design, from its new style front panel, to its excellent mechanical rigidity and large scale integrated circuitry. Your IC245 comes complete with mounting bracket, mic, English manual and VICOM 90 day warranty. Price \$479. Optional sub adapter \$125.

## SPECIFICATIONS

### GENERAL

Frequency Coverage Modes	*144.00 to 148.00 MHz FM (F3)
Supply Voltage	*SSB (A3J), CW (A1) DC 13.8V ±15%
Size (mm)	90H x 155W x 235D
Weight (kg)	2.7

### TRANSMITTER

TX Output	F3 10W *A3J 10W (PEP), A1 10W 40 dB or better
Carrier Suppression	-60 dB or less below carrier
Spurious Radiation	
Maximum Frequency Deviation	±5 kHz
Microphone Impedance	600 ohms

### RECEIVER

Sensitivity	*A3J, A1 0.5 microvolt input gives 10 dB S+N/N or better F3 0.6 microvolt or less for 20 dB quieting S+N+D/N at 1 microvolt input, 30 dB -8 dB or less (F3) -60 dB or better
Squelch Threshold	
Spurious Response	

### SYNTHESIZER

Frequency Range	144 MHz to 148 MHz
Step Size	5 KHz for FM *100 Hz or 5 KHz for SSB per C in the range of -10 to +60 C, 0.0000145% per C
Stability	

\* Valid with SSB Adapter only

THE BEGINNING OF THE ICOM VFO REVOLUTION



### ITS CRYSTAL CLEAR!

The IC225 Australian model is a PLL synthesised rig with PROM for frequencies 145-148MHz. Simplex, duplex or duplex reverse is achieved by a flick of a switch on the front panel. This fabulous rig features ceramic discriminator, IDC, electronic tx/rx switch, full swr protection, and VICOM 90 day warranty. Your new IC225 comes complete with mic, mobile mounting bracket, plugs and dc cable. Metrics is factory programmed for WIA bandplan repeater and simplex channels and a supply of spare diodes for private channels is provided. Price \$269.

The IC211 is the all mode PLL transceiver featuring twin optically coupled VFO's, VOX, cw monitor, pulse type noise blanker, ac/dc capability, built-in swr bridge and full coverage from 144-148 MHz. The rig is fully synthesised in 100Hz or 5kHz steps using the ICOM developed CMOS LSI. Semiconductors include 91 transistors, 16FET, 14 IC, 90 diodes and 1 LSI. The IC211 comes complete with mic, cables, English Manual and VICOM 90 day warranty. Price \$785.



### NEW NICAD PACK

This pack has been especially designed to fit neatly into the ICOM portable transceivers in place of the dry cells. It consists of 10 nicad batteries (900mAh) together with a charger (13.8vdc input) allowing the NICADs to be charged from a car battery or a bench power supply. Complete kit and instructions \$57.

### THE MOST POPULAR FM PORTABLE!

The IC215 is the take-anywhere 2m fm portable which puts good times on the go. Change vehicles, climb a hill, take it in the boat, the ICOM quality communications go right along with you. Features fully collapsible antenna (with optional "rubby ducky") 15 channels, dual power (3w/400mw) crystals are the same as the IC22 series. Your new IC215 comes complete with mic, carrystraps, dry cells, plugs, English manual, VICOM 90 day warranty and three popular channels. Price \$199. Rubber Ducky antenna \$13.

IC202 2M SSB portable transceiver	\$219
IC502 6M SSB portable transceiver	\$219
IC2PS matching power supply	\$115

**PORTABLES**

WARNING: Purchasers of Amateur gear may be asked to produce evidence of a licence or indication that the purchaser is studying for an Amateur or novice examination. The law requires that a licence be held for all transmitting equipment.



**IC211**

**ICOM**

Head Office & mail orders ...  
139 Auburn Rd, Auburn, Vic. 3123 Ph: (03) 82-5398

VICOM Nam gear also available at:  
Jack Gilman, 23 Whiting Street, Artarmon Ph: 439 1271  
Sydney  
Dacum Electronics, 29 Colbee Cr, Phillip Ph: 82 3581  
Adelaide  
Graham Sedgwick, 22 White Ave, Unley Ph: 43 7081  
Perth  
Nercomics, 388 Mantua Ave, Woodlands Ph: 86 3232  
Brisbane  
Elite Electronics, 69 Vardell St, Darra Ph: 38 4480

**VICOM**

VICOM the communication specialists VICOM the communication specialists

#### Duplexer:

Eight cavity notch configuration.  
Insertion loss: 1.7 dB from antenna to receiver or transmitter.  
Notch bandwidth:  $\pm 35$  kHz at  $-100$  dB.

#### Control Logic:

TTL and CMOS.  
Time out: 3.5 minutes  $\pm$  1.5 minutes.

Identification: MCW, 800 Hz at 20 w.p.m.  
Mode of initiation: A callsign will be started at the end of the transmission tail if — (a) there has been no transmission received for 30 seconds  $\pm$  20 seconds,  
OR (b) no callsign has been transmitted in the previous four minutes.

#### Range:

This depends to a large extent on the terrain, but appears to extend to between 200-400 km for base stations, given average conditions.

#### Height:

Antenna: 1770m.

## COMMERCIAL KINKS

Ron Fisher, VK3OM

3 Fairview Ave.,  
Glen Waverley, 3150

This month we will take a look at three rather different subjects ranging from a modification to the popular HAM II antenna rotator, a solution to the FM problem on the old SB34 SSB transceiver and a harmonic problem being encountered with the TS-520 transceiver.

#### THE HAM II ROTATOR

One of the big improvements that the HAM II rotator have over the older HAM M is the provision of a separate brake control which allows the application of the brake after the rotator has actually stopped. If used correctly, this feature will save a considerable amount of wear on the brake mechanism. However as users of this device will know in the heat of chasing a net DX contact, it is very easy to get the sequence of releasing the control buttons into the wrong order. To overcome this and in fact make the release of the brake control quite non-critical, Tom Fishpool P29KE has come up with the solution. The circuit is self explanatory. While on the subject of rotators, this same feature can of course be added to the HAM M unit to give smoother stops and consequently less wear on the braking unit. I

seem to remember that this has in fact been covered in one of the American magazines but at the time of writing this I have been unable to turn it up.

#### THE SB34 TRANSCEIVER

Although there are quite a few SB34 transceivers in Australia, very few amateurs know just what they are, so before getting around to the modification perhaps a quick description might be in order. Manufactured in the United States by the Side Band Engineering Company during the 1964-65 period, it was perhaps the first solid state valve final transceiver ever produced. Covering 250 kHz sections of the 80, 40, 20 and 15 metre bands its compact size has only recently been improved on by the well known Atlas. One problem that crops up frequently with the 34 is an FM effect with normal sideband modulation. The trouble in the VK3OM SB34 was traced to the voltage regulation of the VFO. Extremely small variations in voltage produced quite large changes in frequency and although the VFO is fed from a regulated source, the shunt type regulator used is just not adequate for the job. Solution, fit one of the new IC type regulators, in this case an LM 340/6. As the VFO actually requires 7 volts a silicon diode was connected from the centre leg of the 340 to ground. As the 340 is a three connection device — volts in, earth and regulated voltage out, connection into circuit is simple. There is no need to remove the original regulator, just disconnect the VFO DC feed wire and take it to the LM-340.

With this done the FM will disappear like magic and the overall stability will also improve particularly under mobile conditions with varying input voltage.

#### THE TS520 TRANSCEIVER

I have had reports that the TS520 is prone to producing high level harmonic output in the 90 to 140 MHz region. In one or two cases this has led to interference to aircraft radio operation. To check this out on my 520, I loaded up on 20 metres and ran carrier in the tune position. Under these conditions the rig is running about 25 watts output. A quick tune around on the FM tuner in the next room disclosed a strong harmonic on 98 MHz. Running full output with a linear would certainly bring this up to a high level. According to Jack VK3UO, the solution is to improve the grounding of the final tuning capacitor rotor. A couple of wipers made up with phosphor bronze or the like and secured to the final cage at the point where the shaft leaves the box will apparently break up a resonance that occurs in this circuit. If any readers have had experience with harmonic radiation from TS520's I would like to hear from them.

Remember . . .

### N.Q. CONVENTION

Details in March AR

\*\*\*\*\*

### G3LL RF CLIPPER

RF Speech Processors designed and constructed by the author of the article on page 8, February AR, are available ex stock. These units are specially designed for the popular YAESU FT101 series, and FT200 Transceivers, and in addition to increasing effective speech power, also provide considerable gain on "receive". They are excellent value at \$80 for each model.

E. L. COLYER VK2BEL

P.O. BOX 131, PYMBLE, NSW 2073  
Phone 449 4324

\*\*\*\*\*

### QSP

#### WIA PATRON

The West Australian Division is very pleased to announce that H.E. the Governor of W.A., Air Chief Marshal Sir Wallace Kyle, has accepted the invitation to become the Vice Regal Patron of the Division.

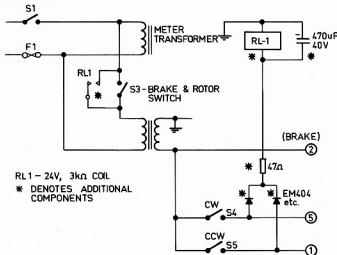


FIG. 1. HAM II Rotator Modification

# Sideband Electronics Sales

## HF TRANSCEIVERS

ASTRO - 200 digital solid state 200 W.P.E.P.	P.O.A.
TRIO KENWOOD model TS 520 - D AC - DC 10 to 80 M.	\$650
TRIO KENWOOD model 520 - D AC only 10 to 80 M.	\$590
TRIO KENWOOD model TS - 820 - S AC only 160 to 10 M. with digital readout	\$980
TRIO KENWOOD model TS - 820 AC only 160 to 10 M.	\$850
TRIO KENWOOD DS 1 DC Converter	\$ 65
VFO - 820	\$145
DG - 1 Digital Display	\$160
YG. 88C Crystal Filter	\$ 64
SP. 520 - 820	\$ 36

TRIO KENWOOD model TS - 700 - A FM-AM-CW-SSB transceivers. Full 144-148 MHz coverage, 10-Watt output, VFO controlled, self-contained, AC-DC operation. **\$650**

TRIO KENWOOD model TS-600-A FM-AM. SSB transceiver full 50-54 MHz coverage 10 Watt output variable form 1 Watt to full power. VFO controlled AC-DC operation. Styling as TS-700-A. **P.O.A.**

TRIO KENWOOD model TR-7400 2 meter FM transceiver 10 to 25 watts output. Frequency range 144.00 to 147.995 MHz no. of channels 800, Double conversion superheterodyne sensitivity better than 0.4 UV for 20 DB. **\$385**

KYOKUTO 2 M FM 15 W output transceivers with digital read-out and crystal synthesized PLL circuitry now tiwh 800 transmit and 1000 receive channels 5 KHz apart, covers all of 144-148 MHz, receive to 149 MHz. No more crystals to buy. Includes simplex, repeater and anti-repeater operation. **only \$310**

## NOVICE OPERATORS

All above HF transceivers will be modified for low cost to suit novice. Requirements 27 MHz conv. x-tals in stock now for kenwood models.

IT IS HERE AGAIN, the well known SE-501 in new style case 15 Watt pep 23 AM SSB for as low as **\$215**  
Same model with AC built in supply and DC built in SWR power meter and many goodies. **\$260**

## ICOM

### VHF TRANSCEIVERS SSB

ICOM model IC-202 2 M SSB portable transceiver 144-144.4 MHz **\$215**

ICOM model IC-502 6 M SSB portable transceivers 52-53 MHz **\$215**

## USED EQUIPMENT

Collins KWM-2 - A in new condition with power supply **\$1,600**  
PM.2  
6146 - b valves RCA new Large stock **\$10 each.**

FDK MULTY QUARTZ with 24 channels 10 sets of crystals supplied 10 Watts, new style. **\$265**

YAESU MUSEN model FT-101-E AC - DC transceivers 10 to 160 M with speech processor **P.O.A.**

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YAESU MUSEN model FT - 301 - S **P.O.A.**

YAESU MUSEN model FP - 301 **P.O.A.**

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FREQUENCY COUNTERS **P.O.A.**

## HY - GAIN ANTENNAS

14AVQ 10-40M. verticals, 19' tall, no guys	\$ 65
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TH3MK3 10-15-20 senior 3 el. Yagi 14' boom	\$220
TH6DXX 10-15-20 senior 6 el. Yagi 24' boom	\$250
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A144-11 11 Element 2M-Yagi	\$ 45
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## ANTENNA ROTATORS

Model CDR Ham-11 for all hf beams except 40 M	\$200
Model CDR AR-22 L junior rotator for small beams	\$ 65
KEN model KR-400 for all medium size hf beams with internal disc brake	\$110
KEN model KR-500 for vertical control of satellite tracking	\$110

All models rotators come complete with 230-volt AC indicator-control units.

6-conductor cable for KR-400-500 **65 cents per metre**

## COAX CABLE CONNECTORS

PL-259	\$1.20
SO-239 Chassi Mount	\$1.20
Male to male joiner	\$1.20
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Angle connector	\$1.70
T-conductor	\$2.00

## COAX CABLE

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## SWR METER

Twin meter model:Y.M. - I.E. 3.5 to 145 MHz prof quality **\$ 28**

DRAKE TV - 3300 TVI lowpass filter **\$ 31**  
SSR-1 Receivers **\$270**

All prices quoted are net SYDNEY, N.S.W., on cash-with-order basis, sales tax included in all cases, but subject to changes without prior notice. ALL-RISK INSURANCE from now on free with all orders over \$100; small orders add 50c for insurance. Allow for freight, postage or carriage; excess remitted will be refunded.

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PETER SCHULZ, VK2ZXL

# NZART JUBILEE VK/ZL/OCEANIA

## DX CONTEST 1976 RESULTS

With the receipt of more logs than ever before in a VK/ZL/O DX Contest, this part of NZART's Jubilee Year Celebration must be considered a real success. Even so, the lack of logs from some areas — particularly the Americas and some European countries is unfortunate. As part of our Jubilee, Participation Cards have been sent to all who submitted logs (direct if IRC sent, or via QSL Bureau), while Jubilee Plaques have been posted to single operator continental winners. What a pity that no awards were made in two areas!

The checking of logs, tabulation of scores, production of results, and the allocation of certificates has been a time consuming but worthwhile task. The use of almost 400 certificates indicates generous allocation of these. This is appropriate to the occasion and the fact that in some "areas", so many logs were prepared and submitted. Special NZART Jubilee Certificates will be sent to a few National Societies whose members supported the contest so well. NZART will again organise the VK/ZL/O DX Contest in 1977 while WIA (Australia) will do so in 1977.

Good DX and 73,  
Jock White ZL2GX,  
NZART Contest and Awards Manager.

### RESULTS

#### PLAQUES AWARDED

	PHONE	CW
OCEANIA	AG6JFY	AG6JFY
ASIA	JA28BK	JA28BK
EUROPE	DL8NU	UP2NK
N. AMERICA	WBXH	W9S2R/3
S. AMERICA	LU3HAK	No entries
AFRICA	9J2GJ	No entries

PHONE	CW
Africa	Asia
9J2GJ	180
S. America	102
LU3HAK	170
Oceania	Oceania
AG6JFY	40254
KG6JL	17310
VR1AA	14097
P29RJ	1848
CR9AJ	152
N. America	N. America
PZ1AH	198
VE7DQ	2343
XE1LLS	60
XE1DU	252
K2CW	227
W2BXD	24
LU1BAW/W3	243
W3TV	147
AC4WSP	8
K9OOU	848
WBXH	11880
W6DGH	2190
K3MNT/7	396
WB6LLR	6272
W2WMT/D	4566
	AC0MHK
	225

#### EUROPE — PHONE

DL8NU	6400	UK2GKW	5504*
DJ4PT	3700	UK2GAG	408*
DL08K	1170	FR1M	1130
DL1KB	848	UR2QD	567
DJ0XT	231	UR2REN	352
DJ9ZB	196	UR2QA	200
DL7VB	60	UR2RJ	48
DLRDC	check	UR2OI	27
DJ0YK	3200	UR2JH	127
DM5UUL	180	UA4BZ	1287
DM3WMJ	check	UW4NP	707
DM3SIC	check	UA4PW	886
DM2CMF	check	UA4IU	245
DM4YEL	check	UA4NAA	204
EZ1A	42	UA4UAZ	46
F0CLU	20	UK4HBB	1485*
G3NAs	1100	UK4WAB	1111*
HA8KCP	528	UK4FAA	18
HA8NP	54	UK4PNZ	check
HA7KLG	100*	UBSWE	3152
IF1P	1229	UBSMCS	2079
OH6BW	276	UY5CO	561
OH1PS/2	108	UBSVA	500
OH2LU	50	UBSUAT	405
OH7NW	2	UBSGBD	144
LZ1QO	1296	UT9PM	64
LZ2RF	40	UY5ZM	68
OK1ATE	322	UBSARJ	372
OK2BRK	150	UBSLAY	24
OK1AEZ	108	UY5PD	18
OK1WT	84	UB5OD	1
OK1TAB	32	UT5OV	check
OK2BJO	28	UK5MAF	4427*
OK1AGN	24	UK5IAZ	1752*
OK1MGW/P	12	UK5WBQ	1342*
OK2SLs	10	UK5QBE	1236*
OK2YAX	8	UK5MBP	70*
OK2KOS	870*	UK5VAA	24*
OK1KSO/P	440*	UK5IAN	2*
OZ2ES	5728	UO5DN	580
OZ5VE	189	UO5OWS	40
OZ4PM	2	UO5HA	2844
OZ1ZE/P	2	UA3QCR	1793
OZ2E	check	UA3GM	540
SP3D01	1606	UA3AAK	376
SP5BT	308	UA3AT	357
SP3RQD	30	UA3DFO	40
SP9KMQ	5	UA3TCH	28
SP4AS	check	W9S2R/3	8
Y06EX	89	UA3NG	3
YU2HDE	1344*	UA3TN	check
YU2CBK	80*	UK3ACM	1872*
SM0GCE	966	UK3XAA	1518*
SMACAN	120	UK3AAC	910*
SM7FDO	54	UK3AAI	882*
SM5MCP	80	UK3DAH	774*
SM6AIW	26	UK3SAB	504*
SM6MGV	10	UK3ABX	70*
SM6BEX	8	UK3TBI	check
SM7CMV	5	UA6LD	620
UA1CS	2717	UA6LAX	472
UA1MU	408	UA6LBC	184
UC2AT	350	UA6JAD	39
UP2BAR	60	UA6LBI	check
UK2BAS	1639*	UA6JWW	3
UK3PRC	2	UK6LDN	check
UQ2GW	408	UA6HBU	check
UQ2GQ	184	UA6LY	check
UQ2HO	105	UO6CC	150
UQ2OAB	24	UF6FCO	2
UQ2MU	16	UK6LEZ	2790*
UQ2GCN	8	UK6AAJ	1078*

#### EUROPE — CW

DL8NU	2860	DM2AYK	1819
DL08K	1358	DM2CMF	734
DL1KB	1330	DM3SIC	174
DJ0XT	385	DM2DEO	64
DL1SV	192	DM3BYB	48
DK5OS	80	DM2AYO	check
DK3KD	48	DM3WMJ	check
DK8AX	8	DM2BHC	check

#### EUROPE — CW (cont.)

E4ABV	30	UA1MA	2
F9BB	100	UA1TB	2
FR1M	8	UA1JN	check
GM3CPS	399	UK1AAA	2976
HASLZ	133	UK1NAA	132*
HASKKN	42	UK1TAA	24*
HASKNB	40	4L1RO	12*
HA7KLG	966*	UK1ADZ	8*
IG6NQ	1008	UK1ZAB	2*
LA2Q	64	UA2EC	264
LA3UG	60	UC2ABT	540
LZ1QO	1560	UC2AAQ	162
LZ2RF	1020	UC2OBI	8
LZ1WI	80	UC2WAS	1
LZ2GS	50	UK2WAO	3*
LZ1XZ	6	UP2NK	3268
LZ1F	2	UP2ND	110
LZ1AA	900*	UP2ND	30
OE1TKW	8	UP2BFB	16
OH2BAH	369	UP2BF	8
OH7NW	288	UP2BAO	check
OH2GCI	192	UP2BDS	578
OH2LU	162	UK2BBS	3454*
OH2JW	140	UK2BAS	1064*
OH1PS/2	60	UK2PAF	870*
OH4XZ	30	UK2PBR	154*
OHSPAT	24	UK2PCP	2*
OH5LJ	128	UQ2SW	1001
OZ7BW	16	UQ2GQ	605
OZ1VY	115	UQ2GEC	2
OZ2E	59	UQ2GKW	1552*
OZ1V	115	UK2BNO	150*
OZ4PM	2	UK2GBY	45
OZ4XT	check	UK2RQD	578
OX4G	24	UR2REN	572
PI1ARS	624	UR2REC	222
OK1TS	420	UR2QI	132
OK2BK	357	UR2RJ	102
OK3MM	336	UR2PL	check
OK1AI	175	UR2QD	8
OK1MIN	108	UA1HA	1424
OK2BHX	96	UW4NP	1050
OK1DKR	84	UA4SM	754
OK2SLs	56	UA4HCM	618
OK2BJ	51	UA4BV	490
OK1KY	33	UA4HVD	114
OK1ATZ	24	UA4ADN	105
OK2PAE	23	UA4HG	90
OK3RB	16	UA4HEJ	85
OK2PFD	12	UA4YAT	68
OK2SYs	8	UA4HBP	32
OK2PAH	4	UA4IU	26
OK1MGW	3	UA4HG	18
OK1ADV	2	UA4HBW	18
OK2BPK	2	UA4PAV	114
OK2SPS	2	UA4HAN	10
OK1KZ	70	UA4HCR	3
OK3TWN	16	UK2BBS	1335*
OK2YAK	2	UK4WAB	check
OK1AIR	check	UK4AI	1058*
OK1AIR	check	UK4FAA	6*
SP3D01	570	UO5GR	306
SP6BCV	540	UO5OWS	60
SP6DMJ	18	UO5AP	check
SP2ABE	160	UP6BD	32
SP6BGG	1770	UA3GM	260
SM5TA	448	UA3OAO	440
SK6J	133	UA3EAL	360
SM5CMP	120	UA3DEA	210
SM6PG	84	UA3AFL	200
YU2BX	744	UA3UJ	108
YU3NP	90	UA3QBQ	126
YU2BKJ	check	UA3ZT	112
YU1AJ	36	UA3JAA	98
YU1GMN	390*	UV3FO	60
YU2HDE	350*	UA3CLC	36
YU2GDE	86*	UA3GBE	32
UA1AGK	306	UA3AFQ	24
UY1YI	220	UY3RY	16
UA1GW	140	UA3ET	10
UA1AHZ	50	UZ3TG	10
UA1ACO	18	UA3ABD	10

\* Denotes multi-operator.



## EUROPE — CW (cont.)

UA3IAT	1	UB5VAW	182
UA3TAM	2	UB5UAT	158
UA3WJU	2	UB5UCI	150
UA3LAR	2	UB5MBY	134
UA3ECF	1	UY500	133
UZ3ER	check	UB5IAM	132
UV3CM	check	UB5VY	126
UA3TCI	check	UK3MAF	120
UA3AEZ	check	UB5VAL	95
UA3AJA	check	UB5SLD	90
UK3DAH	1568*	UB5QAP	96
UK3ACR	1196*	U/500	78
UK3XAA	819*	UB5ICS	75
UK3IBA	344*	UB5VAF	57
UK3SAB	304*	UB5GNV	55
UK3ABX	280*	UB5BZA	55
UK3QAA	182*	UB5ISW	55
UK3TBF	175*	UB5QBG	44
UK3DCF	152*	UB5NQ	40
UK3AC	80*	UT5PK	40
UK3EJZ	8*	UB5VLD	36
UK3TAU	check*	UB5VLB	36
UA6LGN	216	UB5DAX	32
UA6PBA	126	UB5VWA	32
UA6LAX	112	UB5JWA	32
UA6RNP	108	UB5GBO	32
UA6LBO	80	UB5UBI	32
UA6LDD	72	UB5LCH	30
UK6DAU	18	UT5AA	12
UA6LAL	10	UB5TAM	8
UA6ELB	8	UB5QCK	8
UA6YAK	check	UB5HQ	8
UA6EAF	check	UB5HBI	8
UA6YBE	check	UB5HAC	8
UK6LEZ	2794*	UT5LN	4
UK6AAJ	1887*	UB5LVC	2
UK6AAU	462*	UB5FCV	2
UK6ARA	78*	UB5QFB	2
UK6SJA	445*	UY5EK	check
UK6SBE	1334*	UY5EL	check
UK6WBG	1331*	UB5BAW	check
UK6JAZ	912*	UK6EAK	check
UK6MP*	75*	UB5BAX	check
UK6QBL	check	UB5ICK	check
UB5MCS	1275	UB5ZAT	check
UB5WE	1157	UB5UBG	check
UY5DP	852	UB5RAF	check
UB5IDL	820	UB5KAK	check
UB5NU	812	UB5EAX	check
UB5SLY	590	UB5WAL	check
UT5LF	120	UB5ZBB	check
UB5ZAL	264	UB5ZLA	check
UB5MET	216	UK5ICA	check
UB5LGN	182	UB5WAA	check

## ASIA — PHONE

JE1SSS	13135	JE1XRZ	8
JA1FIJ	5859	JI1QGB	8
JH1BUW	2860	JH1NIM	4
JH1KRC	1932	JI1MPP	3
JH1HOH	1540	JF1XCC	2
JA1ZLO	1264	JI1QNX	2
JA1OHC	392	JE1FDD	1
JA1ADU	369	JZ1HLX	19866
JH2CKX/1	276	JZ1JHG	1320
JI1JBX	272	JZ1DI	1296
JA1OVI	264	JH2HFD	990
JA1VZM	248	JZ1XPJ	484
JA1AAT	192	JZ1AZP	387
JA1JUT	182	JR2BGG	238
JI1KAM	144	JA1PTE	258
JA1PUK	161	JZ1BHO	248
JA1YIB	156	JE2BTX	224
JG1IDN	144	JA1JNO	210
JE1GEO	120	JA1JL/2	189
JA1NJD	120	JZ1JG	144
JF1NCT	114	JZ1LWA	114
JA1HST	90	JA1ZLM	60
JG1VPX	72	JA1PQ/2	72
JH1LKH	65	JZ1MKV	30
JF1DYF	52	JA1GHA	24
JE1TSD	56	JA1JHM	24
JG1POB	36	JR2BDB	44
JG1EJB	27	JE2DBZ	12
JR1FWV	27	JA1ZVP	10
JH1KMS	24	JA1ZNP	2
JA1JOY	18	JE2FUP	8
JR1RWK	16	JH1CWC	2
JA1RUJ	12	JA1ZMF	1
JA1DCW	10	JH1DVA/3	18718
JF1SMT	10	JA1CMT	2820

## ASIA — PHONE (cont.)

JA3YKC	2265	JH7EKS	96
JH3JUB	1887	JA7YDB	60
JH3JBY	550	JF7JWS	15
JA3VOV	312	JA7GAX	14
JA3BX	288	JA7UJ	3
JE3SEN	260	JH7MEH	3
JA3UB	168	JA8SW	1740
JR3MVF	152	JA8WQI	603
JA3EJ	73	JA8FMA	24
JA3IBU	52	JA9UX	1342
JF3GKE	44	JA9CGW	612
JE3TYR	21	JA9JBK	270
JA3OIH	10	JA9YAV	84
JH3LNU	10	JA9IKS	48
JF3GNV	57	JA9MUC	35
JA3EYJ	3	JA9AAY	1152
JH3KWO	3	JA9UJG	1157
JF3GFH	2	JA9YUK	970
JF3HYQ	2	JA9FMB	610
JA3SQN	2	JA9MT	350
JH3SOM	2	JA9IB	280
JR3SIT	2	JA9CJZ	135
JH3AIU	1	JA9KUP	75
JA4COS	5759	JA9WJN	24
JA4ENY	4312	JA9CDV	18
JA4BKL	3038	JA9GZ	8
JA4XMI	32	JA9VPM	2
JH4ARN	938	JA9EPI	2
JH4RTX	405	JH4ALB	2
JA4CTM	270	UL7EAJ	1120
JA4SZ	259	UL7NW	328
JA4GTJ	144	UL7QAO	24
JH4DDR	8	UL7WI	12
JA4UDP	84	UK8JAA	364
JH4LWL	84	UV8PP	432
JA4NQD	66	UA9UF	2684
JA4DWB	32	UA9MS	2508
JA5PUL	847	UA9VF	513
JA5UJC	744	URWJT	351
JA5MOU	396	URWZV	273
JA5CHB	320	UA9DS	230
JA5IRY	320	UA9CBO	128
JA5RFY	182	UA9WS	120
JA5PXG	12	UA9CDZ	75
JA5AMPJ	21	UR9BE	40
JA6KAK	3120	UA9FAJ	6
JA6WSB	1944	UA9CBW	2
JA6AHT	1296	UA9FAL	2
JH6RIM	1036	UV9OV	check
JA6UYF	741	UA9YAU	check
JH6RYL	490	UK9ARN	1215*
JA6GDO	168	UK9CDM	100*
JA6ERE	140	UK9CAM	72*
JA6JRI	119	UK9FER	56*
JA6CEK/6	27	UK9MMA	33*
UK9WBD	4*	UK9WBD	4*
JA7FAS	6480	URWLT	5132
JA7EID	4995	URWBE	2178
JA7JH	2484	UA0MI	1635
JA7SPJ	1358	UA0JAY	759
JH7BJS	96	UA0CBO	550
JH7FNM	920	UV0EX	184
JF7NDM	616	UV0MF	378
JA7GZA	509	UA0CAH	152
JH7GPO	378	RA0SER	14
JA7CUW	342	RA0SCQ	2
JA7VEK	240	UK0FAA	6666*
JA7CUK	175	UK0CBE	1334*
JA7AOR	140	UK0SAR	540*
JA7JGD	114	UK0LAM	95*

## AFIA — CW

JR1NRP	7279	JA1RLR	228
JA1CMT	6840	JF1QJD	216
JA1EMX	4200	JA1JOY	196
JA1GLT	1649	JA1BNW	186
JF1MFI	1632	JF1NCT	176
JA1AIF	798	JI1QBG	150
JA1LE	720	JR1LE	144
JA1BFR	648	JE1TSD	132
JA1ITS	546	JA1DYS	119
JA1DSI	533	JF1COE	70
JA1NLM	528	JA1JHM	60
JR1CML	480	JA1VZM	58
JH1LKH	432	JA0FSB/1	36
JR1FWV	420	JA1OP	30
JH1ENA	408	JF1UKJ	28
JH1ESK	407	JA1EL	21
JR1IOS	308	JH1EJA	14
JG1EIG	279	JJ1CJ	10
JH1AIV	256	JJ1DKA	2

\* Denotes multi-operator.

## ASIA — CW (cont.)

JH1OEL	2	JA7JT	320
JA1AAT	2	JA7GDI	272
JA4TNV/1	10	JA7KE	114
JF1WBR	2	JA7EWS	105
JH3QIM	4	JH7KCK	10
JH3BD	4	JH7CJO	4
JH3SOM	2	JASBS	920
JH3SON	1	JASBEV	848
JE3OBH	1	JASGO	160
JF3GHH	check	JASOGI	1380
JR2IEG	1	JASBK	1126
JA2BP	9827	JASFR	312
JA2BI	2814	JASBKW	216
JA2EG	1692	JASCVJ	120
JA2DNA	1152	JASACE	102
JA2PVS	1008	JASKHU	10
JR2IEG	900	JH2BA	1024
JZ2CPD	770	JH2CAZ	333
JA2MYA	610	JACODV	175
JR2BDF	587	JAOWIN	108
JA2HNP	374	JAOCVF	64
JR2XRH	369	JADVM	36
JA2LWA	261	JAGZ	32
JE2CUC	234	JACNCE	12
JR2ACP	216	JAKOHO	8
JA2MIM	148	UL7PBY	836
JA2INO	205	UL7PA	399
JA2VJ	130	UL7TAM	150
JA2JAZ	120	UL7PZ	100
JR2GCS	80	UL7TFB	60
JR2CLJ	75	UL7GBY	52
JR2SDG	65	UL7PBK	45
JE2BTX	55	UL7EAK	45
JR2MCN	48	UL7FAK	42
JA2BLX	40	UL7AQ	30
JA2TK	40	UL7RM	24
JH2TH	32	UL7GAA	20
JE2LPC	30	UL7JC	7
JR2LFW	21	UL7LQ	3
JR2AGL	21	UL7NAA	3
JA2BHA	18	UL7NAL	3
JA2XPJ	10	UL7CAD	3
JA2AB	8	UL7TA	check
JH2QWI	4	UL7TAC	check
JE2BPJ	1	UL7TBN	check
JH2NYZ	2	UL7LH	check
JA2EKR/3	5539	UH8BR	4
JA2AAW	4554	UH8BA	2
JA3YKC	3674	UH8DI	2
JA3BRB	2950	UI8ACZ	133
JA3GHG	944	UI8ADB	132
JR3WXA	504	UI8ACI	88
JA3DDB	243	UI8JAS	738
JA3BAG	203	UI8AZ	133
JR3CQZ	144	UI8AE	48
JH3ARL	4*	UIMMAO	600
JE3SEN	48	UW9PT	1596
JESOUJ	40	UA9HAO	1261
JH3EJ	770	UA9ISJ	1080
JH3KWC	96	UW9WL	94
JA3EEM	30	UW9NW	880
JA3ARM	16	UA9JAA	840
JH3YJC/3	16	UA9YAR	759
JH3TEV	8	UA9UCD	732
JA3XLB	438	UA9ABA	64
JH4LZR	382	UW9MS	450
JA4UD	96	UA9CBM	414
JA4XRN	86	UA9CJU	315
JH4EEN	84	UW9NP	28
JA4GJ3	4	UA9FAJ	252
JA4IUL	30	UW9JA	224
JA4WDG	8	UW9NN	203
JA4JQ	2	UW9WZ	192
JA5GJY	1080	UA9AAH	95
JA5IRY	693	UA9SHM	90
JA5AF	16	UA9ACN	84
JA5MD	6	UA9JMS	68
JA5BSM	5772	UW9BAT	57
JA5AKW	3404	UA9HRD	40
JH5DGO	1998	UA9HAX	36
JA6OKK	984	UW9CGT	28
JA6YAP	835	UA9FAL	21
JA6KAK	770	UA9CAM	18
JA6AHT	538	UA9SHT	18
JA6UYF	169	UW9VC	16
JA6ZSE	161	UA9SCHW	6
JH6KXG	1	UA9CBW	2
JA7MJ	6541	UA9OAI	2
JF7IGS	4401	UW9WF	check
JA7SPJ	59	UA9STS	check
JA7GAX	2373	UW9EI	check
JA7HMZ	2223	UA9CJF	check
JA7CPW	1050	UK9WAP	910*

# ASIA — CW (cont.)

BR3AAA	616*	UA0JAW	312
UK9FER	414*	UA0BAC	138
UK9OAD	2*	UA0ML	125
UA0MI	3036	UA0AAC	125
UA0ZBP	1743	UA0WAS	95
UW0IX	696	UW0CZ	75
UW0ACV	660	UW0AD	64
UW0CBW	624	UW0KAH	10
UW0ACD	526	UW0CBE	1404*
UW0CBO	329	UW0KAA	7*

# SWL

F23060	252	UA3-1701093	746
BR518822	1866	UA3-14246	720
A8808	125	UA3-123238	640
BR53943	2400	UA3-127355	608
DL9266	2040	UA3-123238	576
DE-M24/17701	840	UA3-127321	558
DE19162	572	UA3-122552	540
DL-P26/1562816	252	UA3-170646	540
DL-P26/1542935	252	UA3-157342	528
D10/1516160	56	UA3-170751	416
DM7736-0	2758	UA3-170389	378
DM7215/1	770	UA3-170934	288
DM-EA-8053 IH	612	UA3-118208	276
DM5405/N	432	UA3-170751	256
DM5721/G	18	UA3-170796	238
H46-072	46	UA3-122540	234
HE914N	2812	UA3-157110	203
HE9EVI	60	UA3-12271	200
I2-14713	2772	UA3-170389	200
I0-SH651	1382	UA3-157343	174
I3-64889	952	UA3-15575	140
I2-55791	594	UA3-122843	112
I4-62674	580	UA3-1701091	110
I5-50561	156	UA3-12244	48
I5-60029	80	UA3-142843	32
I1-58999	16	UA3-1701163	32
OK1-11861	342	UA4-09543	5720
OK1-20350	260	UA4-148117	2288
OK3-26327	238	UA4-095171	2128
OK3-26743	196	UA4-148227	440
OK2-14760	100	UA4-095216	324
OK1-5324	86	UA4-131165	70
OK2-16368	70	UA4-148106	26
OK3-26312	51	UA4-09781	check
OK2-18860	24	UA4-09578/MM	8118
OKL-383	272	UB5-0715	1152
NL-4275	564	UB5-068297	729
SM7-5755	200	UB5-071343	700
UA1-16938	624	UB5-072101	660
UA1-144291	392	UB5-0601464	594
UK1-1091	198	UB5-060805	572
UA1-1431	144	UB5-05942	368
UA1-169185	120	UB5-067725	352
UA1-144296	48	UB5-073877	304
UA1-169185	6	UB5-077529	280
UN1-088218	320	UB5-073636	192
UN1-088388	75	UB5-059505	72
UC2-006101	610	UB5071282	64
UC2-0101	208	UB5-0732546	60
UC2-000389	140	UB5-070224	50
UC2-00689	95	UB5-05911	21
UP2-038521	1786	UB5-0731712	10
UP2-038196	1674	UB5-064402	8
UP2-038456	1328	UB5-081202	10
UP2-0381524	1320	UB5-067800	10
UP2-038601	812	UB5-071201	10

UA9-1C555	666	JA5-1231/3	1512
UA9-154832	252	JA3-8943	1184
UA9-15424	336	JA4-30756	1343
UA9-084200	238	JA7-6824/7	2484
UA9-145234	210	JA9-2155	300
UA9-154860	120	UA0-107287	2888
UA9-145197	110	UA0-110109	2392
UA9-165694	110	UA0-11287	960
UA9-165694	check	UA0-124121	656
UA9-1541134	check	UA6-10833/0	520
JA1-18277	2646	UA0-107131	114
JA1-4876	954	UA0-10771	95
JA1-1176	432	UA0-107284	90
JA1-11702	120	UA0-12830	52
JA1-21002	108	UA0-12976	26
JA3-8783	2108		

The VK and ZL results appeared on page 29 of March 77 AR.—Ed.

## VHF-UHF AN EXPANDING WORLD

Eric Jamieson, VK5LP  
Forreston, 5233

### AMATEUR BAND BEACONS

VK0	VK0MA, Mawson*	53.100
VK1	VK1RTA, Canberra	144.475
VK2	VK2WI, Sydney	52.450
VK2	VK2WI, Sydney	144.010
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.600
VK4	VK4RTT, Mt. Mowbulla	144.400
VK4	VK4RBB, Brisbane	432.400
VK5	VK5VF, Mt. Lofly	53.000
VK5	VK5VF, Mt. Lofly	144.800
VK6	VK6RTV, Perth	52.300
VK6	VK6RTU, Kalgoorlie	52.350
VK6	VK6RTW, Albany	52.950
VK6	VK6RTW, Perth	144.500
VK7	VK7RNT, Launceston	52.400
VK7	VK7RTX, Lonah*	144.900
VK7	VK7RTX, Lonah	432.475
3D	3DAA, Suva, Fiji	52.500
JA	JD1YAA, Japan	50.110
HL	HL9WI, South Korea	50.110
KG6	KG6JDX, Guam	50.110
KH6	KH6EQI, Hawaii	50.104
ZL1	ZL1VHF, Auckland	145.100
ZL2	ZL2MHF, Upoer Hutt	28.170
ZL2	ZL2VHF, Palmerston North	52.500
ZL2	ZL2VHF, Wellington	145.200
ZL2	ZL2VHF, Palmerston North	145.250
ZL2	ZL2VHF, Palmerston North	431.850
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

A letter from Roger VK2ZTB advises the Mawson beacon VK0MA is still operational, so it has been listed again. Advice also comes via "QRM" that the Devonport beacon VK7RTX has now been shifted to a new site at Lonah where the 432 MHz beacon and the FM repeater are located, bringing all three together.

A letter from Jeff Pages, VK2BYY, the VHF and TV Group Secretary, advises of the establishment of a new beacon at the QTH of Barry Goodman VK2ZAC at High Range near Mittagong, and is operating on a frequency of 144.120 MHz with the call sign VK2RHR, which it identifies every three minutes on MCW. The transmitter runs 10 watts into five vertically stacked half-wave collinear. The purpose of the beacon is to evaluate High Range as a possible permanent repeater or beacon site. Reports covering a period of about a week would be appreciated, and may be forwarded to Barry at P.O. Box 318, Mittagong, N.S.W. 2575. The establishment of an ATV repeater in Sydney is being investigated.

In response to a request from Graham VK8ZCJ in Darwin for a listing of TV stations suitable for beacon purposes around the 6 metre band, I have this month included a fairly extensive list, and I am indebted to Graham for passing on to me the details of the various Asian TV stations shown listed herewith. It is not anticipated these will be repeated each month, but certainly would be updated where possible as the two equinoxes approach, these being the best periods for TEP and F2 propagation from the north and northeast. I suggest those who are interested should remember the date of this listing or copy them on to a more easily used medium, and kept by the 6 metre equipment.

There may be those who have a bit of a smile when they read of some of the exotic places listed for the beacons, but let me assure you they are listed in all seriousness, and the seriousness paid off for Peter VK5ZPW who lives at Angaston, some 40 miles approximately north of Adelaide. Peter telephoned me with the news that on Sunday, 27th March, he copied the Hawaiian beacon KH6EQI on 50.104 for 2 hours, 0145 to 0345Z with signals peaking to S9 with little QSB. The station was

Graham VK8ZCJ continues in his letter to say he has only recently been able to get back on the air following Tracy, and uses an FT650B to a 5 el. yagi at 35 feet. On 2 metres a VK4ZWP transverter to a QOE06/40 linear with a 10 el. yagi at present on the ground! The first JA opening to Darwin for 2½ years occurred on 13/3 beginning at 0710Z and the last contact at 0808Z, and Graham worked 18 stations in JA with signals peaking over 59. Brian VK8VJ and Neil VK8ZCU were also working the JA's.

Graham's other activities around 6 metres was the reception of Russian/Chinese TV on 49.75 MHz on March 2, 3 and 5. Openings were late in the evening around 2100 local (1130Z), with very strong signals. Mike VK8ZMA reported viewing TV on Channel 0 on 2/3. No amateur signals have been heard on evening TEP.

TV video has been heard on 49.75 and TV audio on 53.75. Wide band FM was also heard on 49.305 with Japanese language on 13/3, in association with the JA opening, but no TV was heard on 49.75, nor any sign of the JA beacon on 52.500.

For the sake of the record Graham mentioned he worked ZL, P29 and all VK States over the Christmas period, over 200 different stations were worked, and he ran up 130 contacts on 28/12/76. The most regular "beacon" into Darwin was Wagga Channel 0, and the VK2WI beacon on 52.450. On January 1 he heard JA's via Es at 0300Z, also ZL TV at 0500Z, both were triple hop Es, but no amateurs were worked in either area.

To conclude the Darwin scene Graham mentions Brian VK8VJ has an FT650B on 6m to 8 elements, and a TS700 on 2m to 6 elements. Neil VK8ZCU has an FT620 on 6m to 4 elements.

Referring back to Roger Harrison VK2ZTB and his letter, he encloses a clipping from QST of January 1977, which mentions trans-equatorial signals being heard on 146 MHz by YV5ZZ in Venezuela from LU7DJZ in Argentina. This followed as a result of hearing fluttery signals prior to AOS for Oscar 7 on orbit 9062A on 8/11/76. Ed YV5ZZ reasoned that TEP could be extended as high in frequency as 2 metres. Upon listening on the 145.9 uplink band, he heard very plainly, about 6 dB above noise, the uplink signal of LU7DJZ. The signal displayed the characteristic flutter usually associated with TE and there seems little doubt that TEP was responsible for reception of the 2 metre uplink transmission of LU7DJZ. Path length 3100 miles. YV5ZZ heard no US stations. Next will come schedules between the two stations in the hopes of making what must be the first 2 metre TEP contact.

Roger comments: "The signals in question are no doubt supported by Class 2 (i.e. night-time) TEP considering the time, frequency and fading characteristics. Considering the VK scene, Darwin is in a prime position for 2m Class 2 TEP to JA. The Ionospheric Studies Group of WRE operated beacons from Darwin on 48, 72,

88 and 102 MHz which were monitored in Yamagawa in Southern Japan, until cyclone Tracy took them away. The 102 MHz beacon was audible at good S/N ratios in Japan for considerable periods around the two equinoxes.

"As Class 2 TEP occurrences increase with increasing solar and ionospheric activity, we should see an increase in the possibility or probability of 2m TEP in the next few years. The terrestrial 2m record could be gained by a VK-JA QSO on 2m via TEP as well as providing some useful addition to research on TEP and the ionosphere. A station having moonbounce capability at each end could almost certainly make the grade, but such sophistication is not really necessary. Run lots of power to the biggest antenna you can raise, and run regular skeds during the hours of 8 p.m. to midnight local time during the equinox periods, as well as other times if it can be arranged. See my original articles on TEP in AR, early 1972."

Those are wise words from someone who should know, and it could well pay the boys in Darwin and North Queensland to consider the upgrading of their 144 MHz capability to the highest practicable limit for what could be an outstanding experience one day.

#### GENERAL NEWS

In the February issue of "Eastern Zone News" from VK3 is an interesting article on "Amateur Radio in Japan" by George Francis, VK3HV. A few items are worth mentioning here. The JARL was re-formed on 29/7/1952, resuming operations with 30 active stations. In 1972 there were 140,000 stations, and at present there are over 450,000 licences! All stations must be approved before coming on the air for the first time by a Government inspector (RI). If later a change of equipment takes place, a new application must be made, and only after a further station inspection and granting of permission, may the changed equipment be placed on the air. The JARL is now authorised to certify station equipment, so long as its power is under 10 watts, thus eliminating the need for a State inspection, and most certainly a painstaking wait. However, for changes in the frequency bands previously licenced, type of emission, antenna or output power, a new application must be made in the normal way.

The Japanese 6 metre allocation is 50 to 54 MHz with phone permitted between 50.1 and 52.5, with 51.000 MHz the calling frequency. On 2 metres the allocation is 144 to 146 MHz, 144.32 to 145.48 for FM and phone, calling frequency 144.480 MHz. The 70cm band extends from 430 to 450 MHz.

Amateur radio in Japan has a current annual growth rate of just under 20 per cent, and Ministry officials have stated that the sharp increase reflects the spread of scientific knowledge in Japan. Simplification of the licensing examination system has helped to boost the numbers of operators in all age groups.

All very interesting, George. We take this opportunity, too, to wish you a happy

stay in New Guinea. George left Morwell in February for a two year stay in that country, and has taken equipment with him and will be active on all bands from 160 to 2 metres inclusive. His address will be P.O. Box 1105, Boroko, Papua New Guinea.

Col VK5RO had an interesting crossband contact recently, when on 20/3 he worked at JH6 station who was on 6 metres, and Col was on 10 metres!

Charlie VK9JD will be operational from Norfolk Island on 6 metres with an FT620B to a 5 element beam. . . VK9ZM from Willis Island is now off 6 metres. . . There will be no 6 metre operation from Macquarie Island for the time being.

#### EME REPORT

Lyle VK2ALU writes in the "Propagator" that tests were scheduled for 26/2 with W4WD and W6ABN. "Nothing was heard from W4WD. Signals from W6ABN were not loud enough to make a contact possible, and he has since advised by mail that his gear is not quite up to moon-bounce standard yet.

"A half hour VK2AMW CQ period then followed, during which we were called by a weak station which we could not identify. He faded out after 10 minutes. Other stations were heard during this period, carrying out their scheduled tests on 432.040, 432.050 and 432.060 MHz. Our echoes were peaking up to 6 dB over noise during these tests."

Lyle also makes a request for 70cm SSB contacts. He can operate between 432.100 and 432.200 MHz with 200 watts PEP transmitter output and approximately 3 kW PEP ERP from antenna. His address is as per the Call Book and would appreciate hearing from anyone interested. He may also be able to organise RTTY on above frequencies, with 100 watts of transmitter output, if anyone is interested.

From the Annual Report of the EME Project Group, Lyle reports that during the 12 months to March, 48 EME tests and 11 CQ periods were scheduled for VK2AMW. They had contacts with 12 different stations, bringing their operating total now to 25 stations in 10 countries, but so far have not been able to contact a 432 MHz station in VK by EME path.

Several dozen stations are now being regularly scheduled over the EME test week-ends each month in addition to QSO's which take place as a result of CQ's. New stations are appearing nearly every month, and the band segment in constant use extends from 432.000 to as high as 432.060.

#### VK2 M:D-WINTER VHF FIELD DAY

Jeff VK2BYV has written enclosing details of the annual VK2 VHF Mid-Winter Field Day Contest to be conducted over the Queen's Birthday holiday week-end, 11th to 13th June. Details are published elsewhere in this issue.

That's all for now. Closing with the thought for the month: "Everybody is ignorant, only on different subjects."

73. The Voice in the Hills. ■

## LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

The Editor,  
Dear Sir,

### RE: CHESS VIA AMATEUR RADIO

I was surprised to read of Chess via Amateur Radio in the January 1977 issue of AR, because of an episode that happened to Len VK3LP and myself a couple of years ago.

We had been enjoying chess contacts for many months, when we were separately contacted and "warned off". I was contacted by an inspector from the Radio Branch and told that someone had monitored our transmissions in Queensland, and (1) that our operating procedure was not correct, and (2) that chess over amateur radio was "not allowable".

To say the least, I was amazed at both of these, because we had taken pains to ensure full standard procedures, including the VK prefix, and because chess is, I believe, an activity within the ambit of allowable activities and conversations.

The inspector did ask me if I wished to contest their comments, but at that stage I was so disturbed at being contacted by them, that my only thought was to quit, and not rock the boat. Having stewed over it for two years, and having seen that January 1977 article, I believe now that I should have taken them up.

I have also found that there are a small number of others who are interested in this interesting activity. I therefore think that it is time for a definite ruling from someone in "Authority" that chess IS an activity that can be conducted. I guess that this action becomes the job of Federal Council, so I would ask that they consider it.

There is no need to regulate operating procedures, because these are adequately covered by our current processes. There are also two standard international methods for writing down chess moves, and as these are known by most chess players, there is no need to formalise that these be used over the air.

I would also ask that if there are any others interested in this activity that they write me a note. Bands (HF) used have been 7.0 and 14.0. There is a good case for VK activity on 3.5.

Bruce H. Bussenschutt VK5OR ■

(Playing chess on the air is not officially regarded as being a suitable subject for amateur communications in VK. This is an expression of opinion by Central Office. Perhaps amateur radio "on air" discussion subjects are more closely scrutinised these days vis-a-vis claims being made by the exponents of "CB".—Ed.)

The Editor,  
Dear Sir,

Reference: the letter published in February AR by Rodney Champness VK3UG. As Mr.

Champness seems intent on procuring a reply to criticism levelled by him at the various groups involved with morse practice broadcasts, I feel I should oblige. His first letter did not go unnoticed, incidentally, but it was the consensus among my colleagues involved in morse practice in VK2 that we should ignore such correspondence until the author chose to "put his money where his mouth is". However, two letters were just too much, hence my reply.

There are several morse practice broadcasts originating on various bands by various divisions—perhaps the two most commonly known are the VK2 and VK5 divisional broadcasts originating at 0930 Z and 1030 Z respectively, on or about 3550 kHz each evening. I believe there is a limited service in VK4 also. As far as I know there is no service from Mr. Champness's division—VK3. In VK2 the practice broadcasts originate from one of eight stations each night of the week with one station spare for contingencies. These operators are generally not mad keen CW exponents but just ordinary amateurs who wish to provide some help to those would-be amateurs needing CW practice.

It is quite wrong to assume that we have not taken the trouble to consult the RFMD regarding the method of generating morse for the exams. We have not only done this, but we have access to and indeed regularly broadcast the actual tapes previously used by the RFMD in the AOCP and NAACP exams to give candidates some idea of the real thing. We would like very much to be able to present this realism all the time, but we can't all be expected (can we?) to shell out 300 or more dollars for a keyboard generator with all the frills that the RFMD possess, and with which these tapes are prepared. The 80MHz VK2 sessions are practice sessions designed not to teach more but rather to provide regular practices (it is up to the individual to learn the characters, etc.). We commence at 5 w.p.m. usually and work up, providing practice in a variety of formats and yes, styles (which is not a euphemism for bad morse), but unless you are going to have everyone use a keyboard preset at certain speeds, weighting, etc., uniformity is impossible. In any case, I would think it could be quite boring to those listening regularly.

Finally, from what we can gather, by all accounts we have quite a reasonable following and play a significant part in the success of many attempting and gaining the AOCP and NAACP.

I think that is a pretty reasonable achievement.

Mark Salmon VK2DI,  
Co-ordinator, VK2 Division,  
Morse Practice Broadcasts. ■

### QSP — AFTERTHOUGHTS

WIANEW March AR, 3rd last paragraph—  
Japanese CB are of course on 27 MHz not 21 MHz as printed.

## TECHNICAL CORRESPONDENCE

The Editor,  
Dear Sir,

### RE: CIRCUIT BURGLAR ALARM — MARCH AR

I regret to say that the bridge rectifier circuit is incorrectly drawn, the rectifier symbol should be rotated 90 deg. clockwise for all connections to be correct.

This occurred due to an interruption at the time, but I don't know how it was missed when checking on completion, maybe getting too old for these exercises! Sorry about this error.

Ed Manifold VK3EM ■

## CONTESTS

### VHF MID-WINTER FIELD DAY CONTEST, 1977

Conducted by the VHF and TV Group, NSW Division of the WIA.

The group is conducting this contest over the Queen's Birthday week-end. Points are biased towards tunable operation. Starts 1200H EAST, SATURDAY, JUNE 11. Finishes 1200H EAST, MONDAY, JUNE 13.

### RULES

1. All VHF bands 52 MHz and above may be used.
2. You may work a station once per band per clock hour.
3. The minimum contact distance is 1 km.
4. Crossband, HF and repeaters may be used to set up contacts, but not for scoring.
5. Oscar 6 and 7 are not classed as repeaters for scoring purposes.
6. Serial numbers, call signs, band, time, mode and location of each station worked must be recorded in your log book.
7. Single Operator Entrants — You must perform ALL operating personally. One log keeper is allowed, plus unlimited moral support.

### SECTIONS

- 1a. Multi-operator Field Stations, 1b. Single-operator Field Stations.
  2. Mobile Stations.
  3. Home Stations.
- The best 6 consecutive clock hours and the best overall score in each of the above sections.

### ENTRIES

Entries must give the call sign and the total points claimed from each station worked; there is no need to submit complete log book extracts. Include a cover sheet and the usual signed declaration.

Entries must reach the VHF and TV Group at 14 Atchison Street, Crows Nest, N.S.W., 2065, before August 1, 1977.

## SCORING TABLE

km	6m- FM TUNE	2m- TUNE 70cm	ATV	576 UP
1-50	2 3	1 3	4 20	10
51-100	4 6	2 6	10 50	50
101-150	10 15	5 15	30 150	100
151-300	20 30	10 30	50 250	200
301-500	50 75	15 45	100 500	500
501-800	40 60	25 75	200 1000	600
801-1200	30 45	35 165	400 2500	700
1201-2000	20 30	75 225	500 2500	800
2001 up	50 75	125 375	600 3000	1000

OSCAR 2-10 Trans/ator 20 VK/ZL, 50 other countries.

70-2 Trans/ator 50 VK/ZL, 100 other countries.

ATV serial numbers must be exchanged on sound and vision.

## ATV NEWS

KEVIN CALLAGHAN VK3ZVJ  
PETER COSSINS VK3BFG

### INTRODUCTION

This is the first of a possible series of Amateur Television reports. The series will be co-authored by Peter Cossins VK3BFG and Kevin Callaghan VK3ZVJ. We hope to compile as much information and news as possible from all States, and to get this news we would appreciate as much feedback as possible from all ATV communities. Most of the information published will be news and happenings from each area, but there will also be technical articles pertaining to ATV.

### VK1, VK2, VK4 AND VK6

Could you please contact either of the authors as to where the activity is, frequencies, localities, liaison frequencies, etc., so that news and notes may be included in this column.

### VK3

At this stage we know of activity only in Melbourne and surrounds. Liaison is on 147.63 MHz FM with a secondary frequency on 147.7 MHz. There are approximately 63 stations capable of receiving, and of these 25 are capable of transmitting. There are undoubtedly many more viewers. Activity is not on an organised basis and QRM is not unknown. The activity is normally on the simplex frequency of 426.25 MHz vision and Inter-carrier sound on 431.75 MHz. Only three or four stations can use the secondary ATV frequency of 444.25 MHz. This secondary frequency is planned as the input frequency of the proposed VK3 ATV repeater.

### VK5

Activity in Adelaide is on a simplex frequency of 442 MHz vision and 446.5 sound. The known stations transmitting are VK4AO, KG, HD, ZBE, ZFX, ZEF, ZOF, GG. All stations can transmit intercarrier sound. The liaison frequency is 53.5 MHz AM. All stations can receive 576 MHz ATV, the proposed repeater output frequency.

### VK7

In Northern Tasmania, Winston VK7EM receives and transmits. Tony VK7AX is pre-

paring to join in. Frequencies are the same as VK3. Working into VK3 is possible during the summer season. We believe that there is also some activity in Hobart. Information please.

### GENERAL NEWS

Through this series we hope to join together the various groups so that designs, equipment and contacts, we hope, can be exchanged. Undoubtedly given the right conditions, ATV DX can be worked over many hundreds of kilometres.

ATV repeater tests have been conducted in Adelaide and an initial test has been conducted in Melbourne. Repeaters in both States are planning on 70cm input and 50cm output.

Most receiving stations use the VK2ZIM converter either Mk. 1 or Mk. 2 versions. Antennae are usually 11 element Yagis, W0EYE 15 element Yagi's or Collinear arrays.

Transmitters range from modified commercial UHF mobiles or base stations, home made or solid state exciters and amplifiers, with series or grid modulation, even screen modulation is in use. The D4LB system from VHF Communications is also very popular. Modulation of a 2 metre final and then using a Varactor tripler has also been tried and works.

Video signals range from test signals to Color cameras and Video tapes. The small closed circuit vidicon camera is very popular and inexpensive. Some of the TV stations have made available their old black and white equipment which has become redundant since they went to color. This has been available at very cheap prices. Many stations are getting very elaborate with their video facilities and can transmit a number of cameras with very professional results.

Don't forget in VK3 to watch the Ron Harrison VK3AHJ ATV segment in the Sunday morning broadcast on VK3BWI at 10.30 East.

## AWARDS COLUMN

Brian Austin, VK5CA

P.O. Box 7A, Craters SA, 5152

### RULES FOR WANCA

1. "Worked All Norwegian Communes Award" is issued by the Vadsø Society of NRRL to all amateurs and SWLs.
2. The award is issued for contact with 25 different Norwegian communes. "Basic" — WANCA MIXED — and thereafter "Stickers" each additional 25 communes contacted till all communes contacted. At present 454 communes and 5 Norwegian arctic/antarctic areas. For WANCA class ALL, all Norwegian communes and 3 of 5 Norwegian arctic/antarctic areas must be contacted. A special award will be issued to all who can confirm contact with all Norwegian communes and all Norwegian arctic/antarctic areas. Only contacts made on or

after 1st January 1975 will count for WANCA.

3. All band, modes may be used. No cross-band or via repeaters. QSO's via Oscar count. Minimum report RST 338 RS 33.
4. Mobile or portable contacts valid, but QTH must be stated during QSO, or printed on QSL card.
5. QSL card not required, log data count.
6. The award fee is n.kr. 30 for "Basic" — WANCA MIXED — award and n.kr. 10 for each "Stickers". No fee for blind-handicapped amateurs/SWL's.
7. "Record Book" listing all Norwegian communes and areas, available from Award Manager WANCA for n.kr. 15. Together with the "Record Book" the Directory of Post Offices will be sent. The Directory of Post Offices list all Norwegian Post Offices and their commune belongings. No fee for blind-handicapped amateurs/SWL's.
8. In addition to "Basic" certificate — WANCA MIXED — the following certificates are issued:  
WANCA — CW: Only contacts made on CW count.  
WANCA — SSB: Only contacts made on SSB count.  
WANCA — RTTY: Only contacts made on RTTY count.  
WANCA — SSTV: Only contacts made on SSTV count.  
WANCA — NOVICE: Only contacts with LB stations count.  
WANCA — MOBILITY: Only contacts with mobile or portable stations count.  
WANCA — SWL: For SWL's. All band/modes count. Mobile or portable contacts count.  
For WANCA — CW/SSB/RTTY/NOV-ICE/SSTV: Mobile or portable contacts do not count. Any band may be used.  
WANCA — CW/SSB/RTTY/SSTV/NOVICE/MOBILITY are only issued to holders of WANCA MIXED. No fee for these certificates, if applied for together with applications for "Stickers" for WANCA MIXED. Otherwise a fee of n.kr. 10. No one may apply for higher number of communes worked than one have on WANCA MIXED on these awards.
9. All fees WANCA/"Record Book" contributed to LASLG's Fund for Norwegian Blind-Handicapped amateurs.
10. Awards Manager will help anyone with identification of commune belongings, if call, full address listed on a sheet of paper and forwarded with 2 IRC.
11. All applications should be made according to "Record Book" signed by two amateurs and forwarded with the fee to

Award Manager WANCA,  
Sverre J. Schmidt LA1QK,  
P.O. Box 3,  
N-9801 Vadsø, Norway.

# ELECTRONIC ENTHUSIAST'S EMPORIUM

## POPULAR INTEGRATED CIRCUITS IN STOCK

CA3012	4.60	CD4026	3.30	CD4724	3.85	LM380N	2.75	MC1496K	2.75	UAA180	3.25
CA3013	5.80	CD4027	1.05	CD40097	1.80	LM381N	3.20	MC1590G	6.75	UA723C	LM723
CA3018	3.50	CD4028	1.80	CD40098	1.80	LM382N	2.60	MC1553	12.50	UA753	3.80
CA3023	6.80	CD4029	2.65	CD40174	2.30	LM387N	2.75	MC1648P	4.90	ULN2208	2.45
CA3026	2.60	CD4030	90.00	CD40175	2.30	LM388N	4.30	MC1649P	4.90	ULN2209	2.45
CA3033	5.20	CD4031	4.70	CD40192	2.90	LM555CN	1.20	OM802	3.20	ULN2111	2.10
CA3039	2.10	CD4035	2.35	CD40194	2.90	LM555H	1.95	SAJ110	2.50	74C00	.55
CA3046	LM3046	2.50	CD4036	2.50	CD40195	2.90	LM556CN	2.50	74C02	.55	
CA3051	1.70	CD4041	2.50	DM9071	1.90	LM562B	10.90	SD305DE	1.30	74C04	.55
CA3059	8.40	CD4042	.95	HEF see	"CD"	LM565N	3.50	SD306DE	1.50	74C10	.65
CA3060	8.40	CD4043	1.25	LM0070	6.20	LM566CN	2.50	SL415A	2.70	74C14	2.80
CA3079	4.50	CD4044	2.30	LM114H	4.90	LM567N	3.50	SL415B	2.70	74C15	2.80
CA3080	2.10	CD4045	3.20	LM301AN	.95	LM7079N	.95	SL4370	3.60	74C85	3.90
CA3081	2.70	CD4046	3.20	LM301CN	.95	LM710CN	1.25	SL440	1.90	74C86	2.00
CA3082	1.70	CD4047	1.95	LM304H	3.80	LM710CH	1.25	SL442	2.90	74C90	2.50
CA3083	2.90	CD4048	.90	LM305AH	3.80	LM723H	1.70	SL447	4.60	74C154	5.70
CA3086	LM3086	CD4050	.90	LM307N	1.60	LM723N	1.25	SL448	1.90	74C160	3.60
CA3089E	2.90	CD4051	2.25	LM308V	2.20	LM725N	5.90	SL610C	1.70	74C162	4.50
CA3090G	6.90	CD4052	2.25	LM309K	2.40	LM733CH	3.70	SL612C	7.25	74C174	2.90
CA3091	18.00	CD4053	2.25	LM310N	3.90	LM733N	2.50	SL613C	12.50	74C192	2.80
CA3120E	4.50	CD4066	1.45	LM311A	3.60	LM741CH	1.20	SL620C	9.50	74C901	1.95
CA3127E	2.50	CD4068	.55	LM311H	3.60	LM741CH	.75	SL621C	9.50	74C929	16.70
CA3128E	9.90	CD4069	.60	LM312H	4.90	LM747CH	2.70	SL623C	17.40	80C85	2.20
CA31307	2.25	CD4070	.55	LM317K	.60	LM747CN	2.50	SL622C	26.90	MISC	
CA3140T	2.25	CD4071	.55	LM319H	5.90	LM748CN	1.20	SL624C	4.60	AL5352	1.50
CA3600	3.30	CD4072	.55	LM319H	7.25	LM1303N	2.60	SL630C	6.90	GL4484	1.80
CD4000	.55	CD4075	.55	LM319N	5.90	LM1310N	3.50	SL640C	10.60	GL5253	.90
CD4001	.55	CD4076	1.25	LM320K	6.90	LM1458N	2.50	SL641C	10.60	OL31	.90
CD4002	.55	CD4078	.55	LM320T	4.50	LM1468N	3.90	SL642C	10.60	RL4484	.39
CD4006	2.30	CD4081	.55	LM322N	4.50	LM1489N	5.75	SL901B	3.90	RL5023	.35
CD4007	.55	CD4082	.55	LM323K	7.90	LM1496N	1.90	SL917B	6.50	FDN357	3.50
CD4008	2.20	CD4085	1.85	LM324N	4.50	LM1498N	3.90	SL918A	6.50	9601	1.35
CD4009	1.50	CD4086	1.85	LM325N	4.50	LM3028	CA3028	SL3046	1.20	9001	1.80
CD4010	1.50	CD4088	1.60	LM326H	4.50	LM3046	3.60	SP405	8.60	9308	3.85
CD4011	.55	CD4092	2.70	LM329N	3.70	LM3080	3.75	SP85C	17.25	9601	2.90
CD4012	.55	CD4503	1.40	LM340K	4.95	LM3900	1.75	TA3000	2.90	NSN71	2.80
CD4013	.90	CD4510	3.20	LM340T	4.95	LM3905	3.90	TBA570	2.90	NSN74	2.90
CD4014	2.40	CD4511	3.20	LM349N	4.50	LM3909	1.50	TBA700	4.90	TL1306A	15.00
CD4015	2.40	CD4512	6.50	LM358N	3.20	MC1032P	2.90	TBA810A	4.90	TL1306	18.50
CD4016	.90	CD4513	6.50	LM370H	4.95	MC1312P	4.80	TL81750A	3.90	95H90	14.50
CD4017	2.25	CD4516	3.20	LM371N	3.90	MC1341P	6.90	TA2020	2.25	2102-2	3.75
CD4018	2.25	CD4518	2.85	LM372H	4.95	MC1341P	6.90	TA2020A	2.25	2102-2	3.75
CD4019	2.25	CD4519	1.35	LM372N	4.50	MC1350P	1.95	TCA420A	4.90	SI883	1.80
CD4020	2.50	CD4520	2.55	LM373N	4.90	MC1351P	3.60	TCA580	6.90	SS0242	15.00
CD4021	2.25	CD4522	1.80	LM374N	4.70	MC1454G	5.40	TCA740	6.90	MA1002	13.00
CD4022	2.15	CD4539	1.98	LM375N	4.90	LM1458N	3.90	TCA740	6.90	782C5CP	2.90
CD4023	.55	CD4555	1.80	LM377N	3.50	MC1468	8.50	TA400C5	5.50	7824CP	.55
CD4024	1.75	CD4556	1.80	LM379	7.50	MC1468	8.50	UAA175	3.25		

In some cases pin for pin substitutes will be supplied.

## POPULAR SEMI-CONDUCTORS STOCKED

7400	48	7443	2.30	74LS258	4.75	74LS174	2.70	BD238	1.80	2N3568	.95
7401	48	7445	2.95	74LS196	7.50	74LS175	2.70	BD437	2.80	2N3568	.95
7402	48	7486	.85	82S23	6.95	74LS181	6.50	BD438	2.80	2N3568	.95
7403	48	7489	1.90	82S24	6.95	74LS182	5.50	BF100	1.20	2N3568A	.50
7404	48	7490	.90	82S90	1.50	74LS193	4.50	BF184	.85	2N3642	.55
7405	48	7491	.90	74LS00	.55	74LS194	2.60	BF200	1.30	2N3643	.55
7406	1.09	7492	1.20	74LS01	.55	74LS195	2.60	BF201	1.30	2N3644	.55
7407	1.09	7493	1.20	74LS02	.55	74LS196	2.60	BF202	1.30	2N3645	.55
7408	1.09	7494	2.20	74LS03	.55	74LS221	2.50	BFY51	1.50	2N3731	5.95
7409	48	7495	1.65	74LS04	.65	74LS222	2.50	BPX25	4.90	2N3819	1.35
7410	48	7496	2.15	74LS05	.55	74LS283	2.75	BSX19	.75	2N3866	2.75
7411	.54	74100	3.65	74LS09	.55	SEMICONDS		BU126	3.65	2N4037	1.25
7413	1.15	74107	.95	74LS10	.60	AC129	1.80	MEF131	1.95	2N4249	.85
7414	1.21	74121	1.20	74LS11	.55	AC126	1.80	MJ802	8.90	2N4250	.65
7416	1.00	74122	1.20	74LS13	1.20	AC255	1.80	MJ803	8.90	2N4251	.65
7417	1.15	74123	1.40	74LS14	2.95	AC128	1.80	MA4502	8.90	2N4256	.65
7420	48	74132	.90	74LS20	.55	AC132	1.50	MPF102	.65	2N4360	.55
7421	48	74133	.90	74LS21	.55	AC137	1.50	MPF103	.65	2N4361	.55
7425	.95	74145	2.95	74LS22	.60	AC188	1.50	MPF104	1.10	2N4547	.55
7426	.70	74150	3.25	74LS27	.60	AD149	2.60	MPF105	.65	2N4548	.55
7427	48	74151	.60	74LS28	.60	AD161/62	4.50	MPF106	1.10	2N4549	.55
7430	48	74153	.95	74LS30	.55	AS327	.18	MPF121	.65	2N4545	.55
7432	.66	74154	3.20	74LS32	.70	AT1138	2N301	MPF603	6.90	2N5590	MPF603
7437	.90	74157	2.20	74LS33	.70	ASV17	2.65	TP131C	1.20	2N5591	11.30
7438	.90	74160	2.20	74LS38	.70	BC107	.35	TP132C	1.20	2N5627	.55
7440	48	74164	2.90	74LS40	.65	BC108	.35	TP120	3.20	2N6084	21.00
7441	2.80	74165	2.90	74LS42	2.20	BC109	.35	TP123	3.30	BA102	.80
7442	2.80	74166	2.90	74LS43	2.20	BC110	.35	TP124	3.30	BA102	.80
7445	2.60	74180	2.90	74LS47	.90	BC178	.40	TP2555	1.70	OA90	.35
7446	2.60	74181	.95	74LS49	1.20	BC179	.40	TP3035	1.70	OA90	.35
7451	.60	74182	.95	74LS50	.75	BC178	.40	TP3035	1.70	OA90	.35
7453	48	74192	2.90	74LS51	.95	BC179	.40	TP3035	1.70	OA90	.35
7454	48	74193	2.75	74LS55	2.60	BC548	.55	2N2222A	1.20	OB41	1.90
7450	48	74194	2.90	74LS109	.85	BC549	.55	2N2646	2.50	BZ261	.75
7451	.60	74195	2.90	74LS110	.85	BC549	.55	2N2647	2.50	BZ262	.75
7472	.75	74196	2.90	74LS111	.85	BC539	1.20	2N9004A	1.50	BZ2X70	1.50
7473	.80	74200	2.90	74LS112	.85	BC640	1.20	2N2905	1.20	BZ2Y93	2.60
7474	.80	74201	2.90	74LS113	.85	BD131	1.20	2N3053	1.20	BZ2Y91	12.50
7475	1.35	74202	1.75	74LS115	2.40	BD132	1.20	2N3054	1.20	P440	5.95
7476	.90	74203	1.75	74LS116	2.40	BD133	1.20	2N3055	1.35	PB60	6.90
7480	1.60	74212	3.30	74LS117	3.85	BD140	1.20	2N3564	.65	MEL12	1.40
7482	2.30	74251	3.30	74LS164	2.90	BD237	1.80	2N3565	.55	FCD620	1.90

## PC BOARD

FIBREGLASS —	
4" x 3" S.S.	.75
6" x 4" S.S.	1.20
8" x 6" S.S.	1.50
6" x 6" S.S.	1.60
8" x 6" S.S.	2.50
12" x 4" D.S.	2.90
12" x 12" D.S.	6.00
2M CONVERT	2.50
6M CONVERT	2.50

## DIP SOCKETS

8 PIN	.....	.45
14 PIN	.....	.48
16 PIN	.....	.54
24 PIN	.....	.95
40 PIN	.....	1.50

## TOROIDS, etc.

IRRESPECTIVE OF MIX		
T-12	.....	.70
T-25	.....	.75
T-37	.....	.80
T-50	.....	.85
T-60	.....	.95
T-80	.....	1.10
T-94	.....	1.50

Free Data on request.

## COIL FORMS

NEOSID/7721	.....	.20
5027/67LB	.....	.20
7100CAN	.....	.20
5200/87LB	.....	.25
7300CAN	.....	.25
F16 or F29	.....	.12

## MISCELLANEOUS

SO239	.....	1.95
PL259	.....	1.95
BNC Pug	.....	2.30
BNC Sockets	.....	1.60
7 Seg Displays	.....	2.50
Miller Collis	.....	Indent
A.R.R.L.	.....	See E.T.I.
Publications	.....	or write
BOXES		
108 x 108 x 50	.....	2.75
216 x 108 x 50	.....	3.75
INSTRUMENT BOX		
160 x 160 x 70	.....	5.90

# INTRUDER WATCH

Alf Chandler, VK3LC

1536 High Street, Glen Iris, 3146

As I have kept much of interest I wish this month, I thought that some comments on recent Observer's reports may be useful. Lately the Voice of America, Philippines has been heard on 14100 kHz with two programs superimposed.

It has been asserted that the programs are Russian language and those transmitted on 11865 and on 9630 kHz. A little fundamental mathematics—twice 11865 equals 23730 minus 9630 equals 14100. Thus, it appears that the second harmonic of 11865 is beating with the fundamental of 9630 producing the spurious transmission. VOA has been alerted and they say—"We are doing major maintenance work and the fault will be attended to in due course".

Another VOA program has been reported on 14175 kHz, but so far we have not got to the cause. We think that the program on 11840 kHz is beating with another as yet unknown frequency. Further reports would be appreciated.

A broadcast on 3537 kHz which has been reported here as 3535, and the word "Fukien" decyphered is—"Fukien Front, People's Liberation Army". 3549.5 reported here as 3550 kHz, we think is still Ambon, Indonesia, but we need further confirmation. In the USA "FCC has sent out telegrams recently on about ten of my complaints". This from K6KA.

If you care to listen on 14180 kHz at about 0600-0630 UT you will hear a carrier, and if you listen intently enough you will be able to compare the program with that on 7090 kHz, Radio Tirana. The second harmonic on 14180, and from America is said "Yes, Tirana is famous for harmonics, but also so are their jammers". NAP heard on 14024 kHz is Red Chinese despite the call-sign, and K6KA says "I had better remind FCC about my summaries alert on NAP. I alerted 14024 not so long ago." He also says "It's odd you don't get BAA67/7/8/20/22/24 with RY's at 0001 Z daily on 14340 kHz". Would somebody with RTTY facilities give me a read-out on this one. ■

## LARA

Ladies Amateur Radio Association

This month will see some LARA members sitting for the Novice exam, so to start off, we wish these people the very best of luck.

Since more Novices will appear on air soon there has been some discussion within LARA as to how Novice activity can be encouraged. It has been suggested that the LARA sked which is currently held on 3650 MHz (on Monday nights at 8.00 p.m. Eastern Time) should move down to 3.558 MHz which is within the Novice band. Some operators already have crystals on this frequency and if the LARA sked were moved, then new YL operators could be

encouraged to buy these crystals and join in. Most current members of the net could change to this frequency with little trouble, so the idea looks promising. This will be brought up and discussed further in the Newsletter and members' opinions and/or objections are welcomed.

Just a general word about the LARA sked. This is a LARA net linking YL operators all over Australia for a regular chat and also the sked allows YL newcomers to try their hands at operating, overcoming "mike-shyness" and coming up to say "hello". To make the net-controller's job easier, it has been agreed that the first half-hour of each sked be reserved for YL operators and YL guests from other stations. After this first segment, the gentlemen are free to join in should they wish.

### LARA VK3 NEWS

This month, the LARA meeting will be combined with a car rally. The meeting will be held on Sunday, 22nd May, at the home of Jean Troubridge, in North Melbourne, starting at 11.00 a.m. Further details can be obtained, as the date gets closer, by contacting Jean on 329 8506. Also in VK3, some LARA members have been representing the club at one of our favourite sports—fox hunting. A LARA team has joined in VHF group fox hunts with moderate success and a great deal of fun.

Once again, best wishes to exam candidates.

33 LARA ■

## 20 YEARS AGO

Ron Fisher, VK3OM

### MAY 1957

Amateur Radio for May 1957 included the start of a series of articles that still continues to be a standard reference. Gordon Brown VK5XU "Modifying the AR7 Receiver" has probably been copied and read by more people than almost any other single series published in AR. Part one contained a general description and the Alignment procedure.

A second article by Gordon, "Adding AVC and Audio Volume Control to the Type 3 Mark II" was also a very popular one at the time. Two different "spy" type transceivers were popular for portable operation at the time, the Type A Mark III and the larger Type 3 Mark II. The Type A covered 40 and 80 with a 7C5 in the final while the type 3 covered 80, 40 and 20, used a 6L6 in the final and ran about 30 watts input on CW. Naturally they were adapted for AM phone operation and were extensively used for both portable and home station operation.

Indeed May was a real "surplus" issue with an AT5 transmitter conversion article by Don Haberecht VK2RS. The old AT5 worked well enough on 80 and 40 but 20 metre operation required doubling in the final and 15 and 10 were not covered at all. Don's article showed how to remedy all of these problems.

Technical articles were rounded out with "A Simple Capacity Bridge for the Blind" reprinted from the New Zealand

Break In magazine, plus quite a bit of data on some of the newer tubes.

The predecessor of the present LARA column, YL Corner, was conducted by Phyl Moncur, wife of Len VK3LN. Phyl wrote mainly about the trials and tribulations of the XYL of an enthusiastic amateur. ■

## IARU NEWS

### NEW PREFIXES

From the January 1977 issue of the IARU Region 1 News the following is a list of recently issued prefixes—

D7A-D9Z — Rep. of Korea.  
S7A-S7Z — Rep. of Seychelles.  
S8A-S8Z — Transkei.

### NEW ITU MEMBERS

From the same source the following new ITU member countries were listed—  
Surinam — Republic.  
Sao Tome and Principe — Democ. Rep.  
Cape Verde — Rep.  
Angola — Peoples' Rep.

### KUWAIT LICENSING

"Readers will recall that OM Collin 9M2CR recently spent 6 months in Kuwait working for ITU. It took all that time—and more—to get to formalities completed for his 9K2 ticket—allotted the callsign 9K2ET. No chance of getting 9K2CR since this was already issued to the D-G of Telecoms himself; though it was never used by that gentleman. No real problems in getting a ticket for anyone able to produce his current licence from a reputable administration such as Malaysia." 9M2CR writing in the MARTS newsletter No. 6. ■

## MAGAZINE INDEX

Syd Clark, VK3ASC

### CQ September 1976

DXpedition to Tonga and Niue Islands; How to Make a Contest More Fun; An Improved Antenna Noise Bridge; A Push-Button to Dial Telephone Converter; Antennas; Simple Antenna Ideas; Novice; Effects of FCC Rules Changes; QRP; Major RF Loop Consideration: Pt. V; The Tempo MR-2 Monitor Receiver (Review); Modern Surplus Equipment for 10 and 6 Metres; Put a Touch-Tone Pad into Your HT.

### CQ January 1977

Slow Scan Television, Overview '77; Announcing the 20th Annual CQ World Wide WPX/SSB Contest; Waveguides, Pt. 2; Conversion of Decimal and Seven Segment Signals Back into BCD; Sending and Receiving QSL Cards; The Yassu YC1355D Frequency Counter (Review); Signal/One Transceiver Improvements; A Voltage-to-Frequency Converter IC with Amateur Applications; Making IC Projects Work; Improving CW Selectivity in the Argonaut; The G3NGD Semi-Vertical Antenna; In Focus: 1977—A Look Ahead.

### CQ February 1977

A DXpedition to Trinidad Island; The Kenwood TS-820 Transceiver (Review); The

# Hy-Gain's Incomparable HY-TOWER

for 80 thru 10 Meters  
Model 18HT

- Outstanding Omni-Directional Performance
- Automatic Band Switching
- Installs on 4 sq. ft. of real estate
- Completely Self-Supporting

By any standard of measurement, the Hy-Tower is unquestionably the finest multi-band vertical antenna system on the market today. Virtually indestructible, the Model 18HT features automatic band selection of 80 thru 10 meters through the use of a unique stub decoupling system which effectively isolates various sections of the antenna so that an electrical  $\frac{1}{4}$  wavelength (or odd multiple of a  $\frac{1}{4}$  wavelength) exists on all bands. Fed with 52 ohm coax, it takes maximum legal power ... delivers outstanding performance on all bands. With the addition of a base loading coil, it also delivers outstanding performance on 160 meters. Structurally, the Model 18HT is built to last a lifetime. Rugged hot-dipped galvanized 24 ft. tower requires no guyed supports. Top mast, which extends to a height of 50 ft., is 6061 T6 tapered aluminium. All hardware is Iridite treated to MIL specs. If you're looking for the epitome in vertical antenna systems, you'll want Hy-Tower. Shpg. Wt., 96.7 lbs.



## NEW ...

Special hinged base assembly on Model 18HT allows complete assembly of antenna at ground level ... permits easy raising and lowering of the antenna.

## The Versatile Model 18V for 80 thru 10 Meters

The Model 18V is a low-cost, highly efficient vertical antenna that can be tuned to any band ... 80 thru 10 meters ... by a simple adjustment of the feed point on the matching base inductor. Fed with 52 ohm coax, this 18 ft. radiator is amazingly efficient for DX or local contact. Constructed of heavy gauge aluminium tubing, the Model 18V

# HIDAKA'S VS-41/80KR

for 10 thru 80 Meters

- An Individually Tuned High-Q Trap for Each Band
- Takes Full Power
- Rugged Total Performance Construction
- Easily Installed Using Minimum Space

Now ... a modestly priced easily erected all-band vertical that delivers outstanding omni-directional performance on each band ... HIDAKA'S Model VS-41/80KR. It is ruggedly constructed of heavy gauge, taper-swaged aluminium ... uses four separately tuned High-Q air dielectric traps ... each trap factory tuned to provide maximum performance 80 through 10 meters. Uncompromised performance for short haul or DX communication is ensured by the low angle radiation pattern developed by the VS-41/80KR. SWR is 2:1 or less on all bands. If mounted in an elevated position a radial wire system should be used. An accessory TRAPPED radial wire kit is available, the Model VS-RG. The VS-41/80KR comes complete with Terelyne guying cord.

## TECHNICAL DATA

Power Rating ..... 1 kw AM, 2 kw SSB  
Feed Line Required ..... 50-70 ohm coax  
Minimum Ground ..... 8ft. Ground Rods Required  
Overall Height ..... 28.4 ft.

may be installed on a short 1 1/2 inch mast driven into the ground. It is also adaptable to roof or tower mounting. Highly portable, the Model 18V can be quickly knocked down to an overall length of 5 ft. and easily re-assembled for field days and camping trips. Shpg. Wt., 5 lbs.

## Also available from BAILS —

VS-2GH 2 metre $\frac{1}{4}$ wave G.P.	\$35.00
VS-6GH 6 metre $\frac{1}{4}$ wave G.P.	\$37.00
ARX-2 three half wave 6dB gamma loop matched vertical	\$49.00
ARX-450, 435-450 MHz three half wave 6dB Ringo	\$45.00

Prices include S.T. Allow 50c per \$100 insurance, min. 50c.

Prices and specifications subject to change. Freight extra.



**ELECTRONIC  
SERVICES**

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Distributors in all states and N.T.

FRED BAIL VK3YS  
JIM BAIL VK3ABA



Multi-Band Trap Antenna, Pt. 1; Report on NGV's SSTV Pics. from Mars; The Gross CW-25 Transmitter; Understanding Coaxial Cable; Single Sideband Theory for People Who Don't Understand Single Sideband Theory; On a Clear Day You Can CFAR Ever; The Powerlarm, A Log-Periodic Quad Array; A Synthesiser for the HT-220; Peak Envelope Power; Slow Scan Television, Overview '77, Pt. 2.

#### QST January 1977

Understanding Linear IC's; A Dual-Gate MOSFET Dip Meter; The DVM/Frequency Counter Becomes a Clock; A Gated Noise Source; A Prototype Pulse-Code Modulation System; The Microprocessor and Repeater Control; Reviews, Heathkit HR-1680 Receiver; Heathkit HS-1661 Speaker; Palomar Engineers R-X Noise Bridge; Heath HW-2021; The Barlow-Wadley XCR-30 Re-

ceiver; Kronotek RF-Actuated Timer RT-1; National Semiconductor SC/MIP Microprocessor; A New Look Noise Blanka That Works; A Hybrid 20 Metre Quad; Speak Up We Can't Hear You; Getting to Know OSCAR from the Ground Up; We've Only Just Begun; The Canadian Winter Rally; Chart Your Way to Better DX; Your SCM and How He Is Elected.

#### RADIO 25 December 1976

A December Night's Thoughts; Shoot for the Horizon, Pt. 1; Marconi of the South African Police.

#### 73 December 1976

Go Toned for Ten; World's Simplest Five Band Receiver; How Do You Use IC's?; Hamming 101; A Super Cheap IDeR; The ZF Special Antenna; CT7001 Clockbust; Saving a CBeR; A Ham's Computer; What's All This LSI Bunk?; The Soft Art of Pro-

gramming, Pt. 3; New Improved Monitor; Put Snap in Your SSTV Pictures; What's All This Wire-Wrap Stuff?; Exploding the Power Myth; Exploding the SWR Myth; Bring a Dead Band to Life; The IC22 Walkie; The Latest in Counters; The Five Minute COR; See the World and Get Paid; Watch DX With a Spectrum Analyser; DXing with a Weather Map.

#### HAM RADIO December 1976

High-Frequency Communications Receiver; Low-Frequency Loop Antennas; QRP 7 MHz CW Transmitter; Broadband Amplifier Uses MOSpower FET; Electronic Meter Amplifier; ASCII-to-Morse Code Translator; Ladder Network Analysis; Resurrecting Old Receivers; Increased Flexibility for MFJ CW Filters; Signal to Noise Performance of Low-Frequency-Shift RTTY; Microcomputer Interrupts.

## IONOSPHERIC PREDICTIONS

Len Poynter, VK3ZGP/NAC

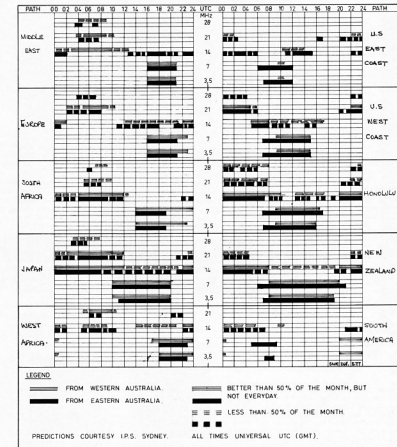
Charts for April and May begin to show the influence of the new cycle activity. Whilst there is no great upsurge in the sunspot count, there is a significant increase in ionospheric quality. The 2800 MHz solar flux measurements are showing up this increase with monthly means around 75 whereas last year they were in the high 60's. In turn these produce changes in the formula for computing path openings.

10 metres is showing many awakening signs—not just to the occasional users but the solid adherents who are finding increasing path openings. 15 metres is also showing plenty of activity with plenty of DX being worked. 20 metres is well and truly alive along with 40, 80 and 160 metres.

There have been significant increases in signals across most paths in recent months, particularly those lying close to and indeed over the polar regions showing more reliability. These are encouraging signs as a decrease in polar cap absorption will open up paths that have been dormant for quite a while.

The Dec-Jan. reports from Zurich indicate a rise in the running smoothed number becoming more apparent as 1977 draws on. It is still too early to say when the low mathematically occurred, perhaps by late 1977 it will have become apparent. However there is still life in the old cycle spots and the newer ones are well up in activity when they occur.

With the next maxima predicted for around 1982 with a number around 50 (like 1974) will force many to look closely at antennas if they seriously wish to work DX. It will be many decades before we see conditions anything like the two previous maxima. However those who know the signs and use them to their advantage will be working more than the average share of DX.



With WARC 79 and the prospect of some additional bands I have recently had a look at some forward predictions. Two interesting prospects are 18 and 24 MHz and 10 MHz looks also very promising. Whatever the outcome will be, it's desirable that whatever we have now should be well used.

In closing I wish to add a word of

thanks to Bert VK3GS who has assisted me over many months with his sunspot observations from his well equipped observatory. His untimely addition to the Silent Keys has left me without an eye on the sun. I certainly will miss his excited calls to tell me of news of sunspots.

VK3ZGP/NAC

# HAMADS

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- QTH means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

## FOR SALE

**VHF Specials**, tubes, new, unused, QOV03-20 \$20 ea.; QOV05-40 \$30; 2E25 \$10; Nuvisors \$8/W4 \$10 ea.; 7587 \$12 ea.; Nuvisors bases \$2 ea.; QOV bases \$3 ea.; general radio frequency meter, 726A 10 to 200 MHz, \$85. VK2BFJ, 90 Woyong Road, Killarney Vale, N.S.W. 2261. Ph. (043) 32 5758.

**AWA-R60**, low band un-mod., cables, transistor P.S., handset and cradle, VGC, \$20; Pie, Victor, low band un-mod., VGC, less m.c. insert, \$15; AWA-R60, 6 high band 5 channel switch, no sta's, VGC, \$30. VK3EM, QTHR, Ph. (03) 58 7745.

**SSB Tx**, 100W output, 80 thru 10m, uses two 6146 final amplifier tubes, Hallicrafters model HT-37, 240V AC operation, \$250. James VK2JO. Ph. (02) 36 2916.

**Moving overseas**, must sell FT101E, IC22A with channels 40, 50, R42 and R48. Both in A1 condition with original controls, also Heathkit HW101 less power supply, in working condition. T. Dobler, Box 883, Mackay 4740.

**National Panasonic** 3 band, 2 speaker, 14 transistor Rx, as new. Tunes 530-1600 kHz, 2-3.7 MHz, 7-22 MHz, \$40; MFJ SSB filter, SBF-2, as new, \$25. Philips Black and White TV, 21 inch, on lags, in excellent order. VK3LJ, QTHR, Ph. (03) 599 2566.

**Europa 144 MHz** transverter to 28 MHz, 200 watts p.e.p. and excellent reception. Plugs into most Yaesu transceiver or split frequency, brand new, \$220, two only. VK3DS, QTHR.

**Heath HW32** 20 metre, 200 watt transceiver with H.D. power supply (M.B.) and manual. This is a first class performer, home or mobile, and it's light, \$200. VK3DS, QTHR.

**IC21A FM Transceiver**, base/mobile station, 10 pairs crystals, AC/DC, excel. cond., little use, \$200; Ranger ARX2 2m antenna, \$25; Y-gain 2m 5/8 whip with magnetic base, exc. performer, good cond., \$25. VK3LJ, QTHR, Ph. (053) 32 3412.

**Yaesu FT 101B Transceiver**, 10 to 160m, VVV, SSB, AM, CW. In first class condition, very little use 230V AC or 12V DC supply, additional 11 locked position and inbuilt speaker, self contained 13 1/2" x 6" x 1 1/2", suitable for stationary or mobile use, \$395. VK2AXS, P.O. Box 954, Parramatta. Ph. (02) 635 1320.

**Commercial radio mast**, four 12 ft. sections, top fitting for 12 ft. 2 in. pipe, self supporting, hot dip galv., heavy construction, excellent condition, \$400. VK2AXS, P.O. Box 954, Parramatta. Ph. (02) 635 1320.

**Modern quiet 16 sq. brick country home**, with 23 ac., excellent DX position for HF, VHF, UHF, beautifully located upon Hawkesbury area, 1000 ft. el., unrestricted view Blue Mountains, 3 br., central heating, all electric, good double garage and shed, heavy 80 ft. tower, radial earthing system, 240V aux. diesel unit, 42 air miles from Banks-own, air strip with hangar available, delightful bush walks, unspoiled native flora and fauna, perfect place to get away from it all, only one hour's drive Hornsby, \$71,000. VK2AAK, P.O. Box 954, Parramatta. Ph. (02) 635 1320.

**Collins KWM2 Transceiver**, purchased new, no mods., excellent DX unit, \$1,200; PM2 Collins portable power supply, \$180; \$1250 Collins external VFO, meter, phone patch, speaker, 100W, 100V unit, \$500; 537T Collins all frequency, stainless steel portable multi dipole, all frequencies, offers; 20A AWA, clean, \$30; 20B AWA 12V FM unit, clean, \$35. VK2AAK, P.O. Box 954, Parramatta. Ph. (02) 635 1320.

**GDO and Megacycle Meter**, 420-940 m.c. by Measurements Ltd., with power supply \$120; steel cable, 3/8", 294m, new, \$115; Dexion 200 ft. heavy duty, \$180; cutter, \$30, all new. VK2AAK, P.O. Box 954, Parramatta 2150. Ph. (02) 635 1320.

**PAL TV Pattern Generator**, Philips PM5509, \$750 or offer. VK4RY, QTHR.

**ICOM IC22A 2m FM 10W**, mobile with mounting bracket, includes Ch. 2, 8, 40 and 50, perfect condition, \$175. VK3AQL, QTHR, Ph. (03) 277 5623.

**QTH for Sale**, 70 ft. ex DCA tower (self supporting) with TH6 6 el. tribander and Ham II Rotator and control, plus B/T Home, 2 double br., lounge and sep. dining room, large alf in kitchen, bathroom, laundry, 1/2 garage, fully fitted, 12 ft. x 20 ft. pool plus 10 ft. square "Snack" amongst trees in garden, located opposite park, 5 min. walk to station and shops, \$38,000. VK2DO, QTHR, Ph. (02) 546 6385.

**ICOM IC292**, as new condition, bought Feb. 1977. Unmodified, covers 144.0 to 144.4 MHz, 3W PEP, Japanese manual, all connectors, getting married and, unfortunately, I need the dbe. Price \$190, negotiable. Doug Rosser VK2ZEX. Ph. (03) 633 2189 bus.

**Multi 2000** 2m fully synthesised SSB-FM-CW transceiver, little used, exc. condition, \$400. Yaesu FT2FB mobile 2m FM rig, Ch. 40, 50, R2, 3, 4, 5 and 6, with direct 4 & 5. \$150. Lafayette HA8000 amateur bands Rx 80 thru 6m, \$150. All in original packing and complete with instruction books and accessories. VK2AOE, QTHR, Ph. (02) 69 5099 bus, (02) 449 6364 AH.

**DX110 Communications Rx**, exc. cond., \$150, a'so two Midland twin twiler SWR bridges, exc. cond., \$25 ea., also 13.5V 5A power supply, solid construction \$50. Ph. Bert (02) 42 5312 bus, (03) 758 4088 AH.

**Uniden 2200 transceiver**, complete with external speaker in first rate condition, \$700. Bob Cunningham VK3ML, Ph. (03) 20 7780 QTHR.

**Modulation Transformer Thoradon 60W** mounted in a home-brew Bx Rx complete with HT power supply, \$40. ONO, exc. cond., \$100. Contact John VSD VK3ZVZ, 12 Great Valley Rd., Glen Iris, Vic. 3146, Ph. (03) 25 4953 AH.

**One little Dick Power Supply**, 12V, 3 amp., \$20.00. Good cond. VK3TG, QTHR, Ph. (058) 32 1636.

**Huatter Whips**, 80, 40 and 20m, complete with M02 mesh, bumper mount, base mount, new, never used, \$110. Yaesu speaker (main mount), 100W, 100V, exc. cond., \$30. Yaesu YD-344 microphone, new cond., \$30. C. P. Singleton VK4UX, 45 Edward St., Dalby, Q. 4405.

**FT101 Mark 2 transceiver** (same as 101B), exc. cond., little used, complete with original packing box, instruction book, mic. etc., no mods, \$525. ONO. A'so DC75 power supply C/W motor mount for FT75, used once, \$40. ONO, VK4XT, Ph. (074) 62 2389 or write PO Box 496, Dalby, 4405.

## WANTED

**Transistor communications HF Rx**, Barlow Wadley or similar. Jim VK4QK, QTHR, Ph. (03) 219 219.

**Constructional details** for AC transformers with secondary winding 24V up to 750W rating. Please write to S. A. Flett, 14 Wade Street, Lismore 2480.

**Afex 210X transceiver** or any small HF transceiver like Swan monobanders etc. for mobile use. VK4XT, Ph. (074) 62 2389 or write PO Box 496, Dalby, 4405.

**Information on ARR/ATS**, particularly on modification and improvement for a new Amateur wanting so-called 'on experience'. Ph. (07) 49 1793. 49 Kinross St., Reservoir, 3073.

**HF Transceiver**, second-hand, preferably Yaesu FT101, FT200, FT400, a'so Ken PK202 2m hand-held and 4CX250B valves, chimneys and parts to suit VHF Linears. Any reasonable condition. Graeme VK7ZAG, Ph. (004) 27 8992 (mornings).

**Pair Selys Motors**. Particulars to VK4SD, QTHR.

## RENTAL

**VK3AOG** will be in Cairns June-Sept, approx. The home QTH on Murray at Barnah is available for modest rental. Tower with TH3 and 2MT beams, home brew linear. Home is new, Color TV, dishwasher, etc. Ph. Tom Savers (058) 69 3263.

# SILENT KEYS

It is with deep regret that we record the passing of —

Mr. A. JACOBSEN VETGCF (formerly VK6WB and ZL3WB)

Mr. A. J. E. FORSYTH, O.B.E. & G.F.O. (Proprietor of Short Wave Magazine)

Mr. R. W. WILKINSON VK3AKC

Mr. A. S. LITTLE VK5AF

Mr. J. W. LADE L40576

RON WILKINSON VK3AKC

The amateur fraternity were saddened to hear the news of the death of Ron Wilkinson VK3AKC, of Geelong, on Tuesday, 22/3/1977. Darrell VK3AOR was kind enough to phone me on the Wednesday with the news, and I appreciate his promptness in letting me know, so word could be passed to Ron's many friends.

Ron was always noted for his cheery greetings on the air and giving his location as Geelong-oh, something we all appreciated.

His dedication to the art of VHF and UHF was recognised universally, and his many years of activity included operation on all bands from 160 metres to 1296 MHz, and currently with such modes as SSB, CW, FM and ATV. His activities on 1296 MHz EME operation are legend, and his pioneering efforts in this direction have surely been an inspiration to others, helped by his ready willingness to share his knowledge with anyone showing interest.

His absence from the bands will be particularly noticed in Victoria and Tasmania because he could always be counted upon to come on or be on the air at times when it mattered, providing the other end of contacts across the water for test purposes with other stations, or for possible band openings on 144 and 432 MHz etc.

Over the 17 years I have known Ron and Mary, his wife, I always felt at ease in their company, and as recent as last July my wife and I were guests of Ron and Mary at their home, and have many pleasant memories of the holidays.

Time will heal the wound caused by Ron's passing, but I am sure Ron will be long remembered for his many achievements, as an amateur, for efficiency with his work, which was a pleasure to behold, as a citizen, and as a gentleman. We will proudly remember him.

Eric Jamieson VK5LP

ALBERT SCOTT LITTLE VK5AF

Scott passed away on 12th February following about two years of ill-health. Active as VK5AF since 1948, but with pre-war and post-war amateur interest, he operated mainly DX bands, with almost exclusive mobile facilities over the last few years. He served in the RAAF as a pilot during World War 2 and following successful academic Radiocommunications studies, was employed as a Radiophysicist on the 1953/54 Antarctic Expedition to Macquarie Island, where he operated as VK1AF.

He was awarded the I.R.E. "Fisk" prize for the most successful student in 1952.

Professionally he was employed as the District Supervisor for the Electricity Trust of South Australia, at Strathalbyn, where his Electrical, Civil and Radio Engineering backgrounds were combined in an intense study of the problems of RFI from High Voltage Power lines. His assistance with the local Emergency Fire Service radio system extended over many years.

Scott was frequently engaged in a variety of amateur experiments, often in collaboration with his life-long friend, Bob Edgar VK5RS, and his brother-in-law, Bob Gurr, VK5RG.

The sympathy and friendship of all Amateurs is extended to his wife Marion and their four daughters.

Rob Gurr VK5RG

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